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IRON TRADE REVIEW

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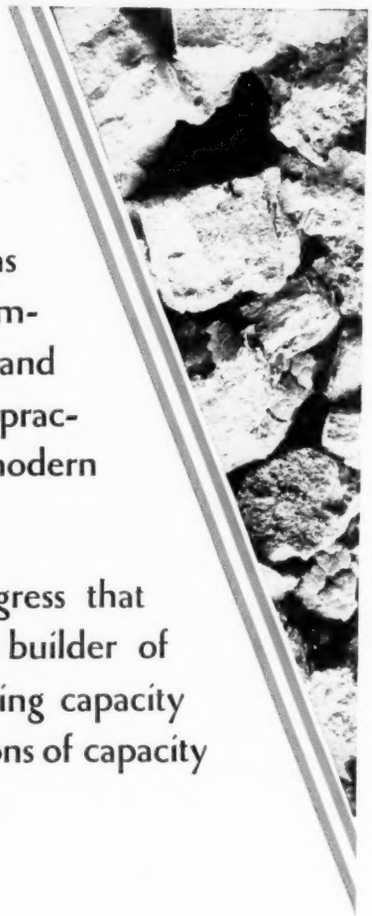

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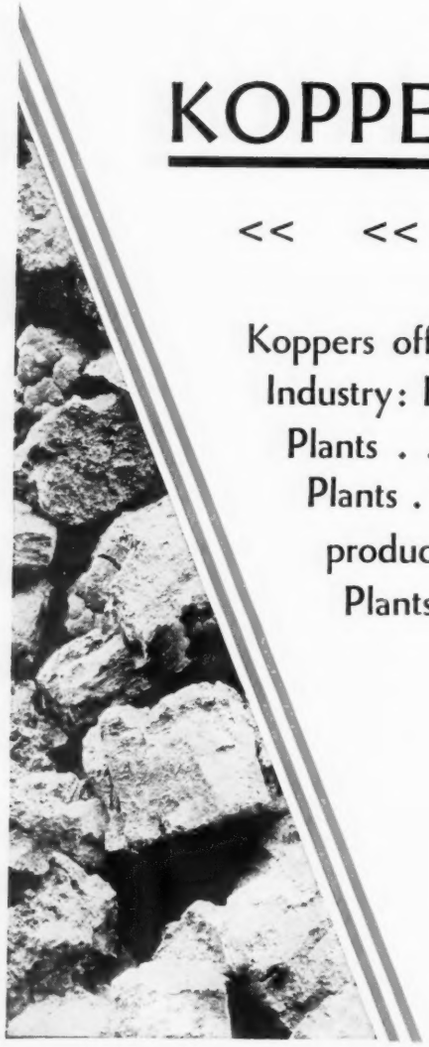

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STEEL

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PRODUCTION ◆ PROCESSING ◆ DISTRIBUTION ◆ USE

Aircraft Industry Turning to Corrosion Resisting Steels. Page 52.

THIS WEEK:

COLOR increases the visibility of the trend lines on the charts in the Business Trend section of STEEL. *The red lines are instantly and clearly perceived, and therefore the slightest change becomes apparent. A further improvement must be noted in the placing of tabular figures alongside the charts, where they are readily available to those who want the exact figures. The finer paper also contributes to the character of this department. Compare it also for its wealth of information.*

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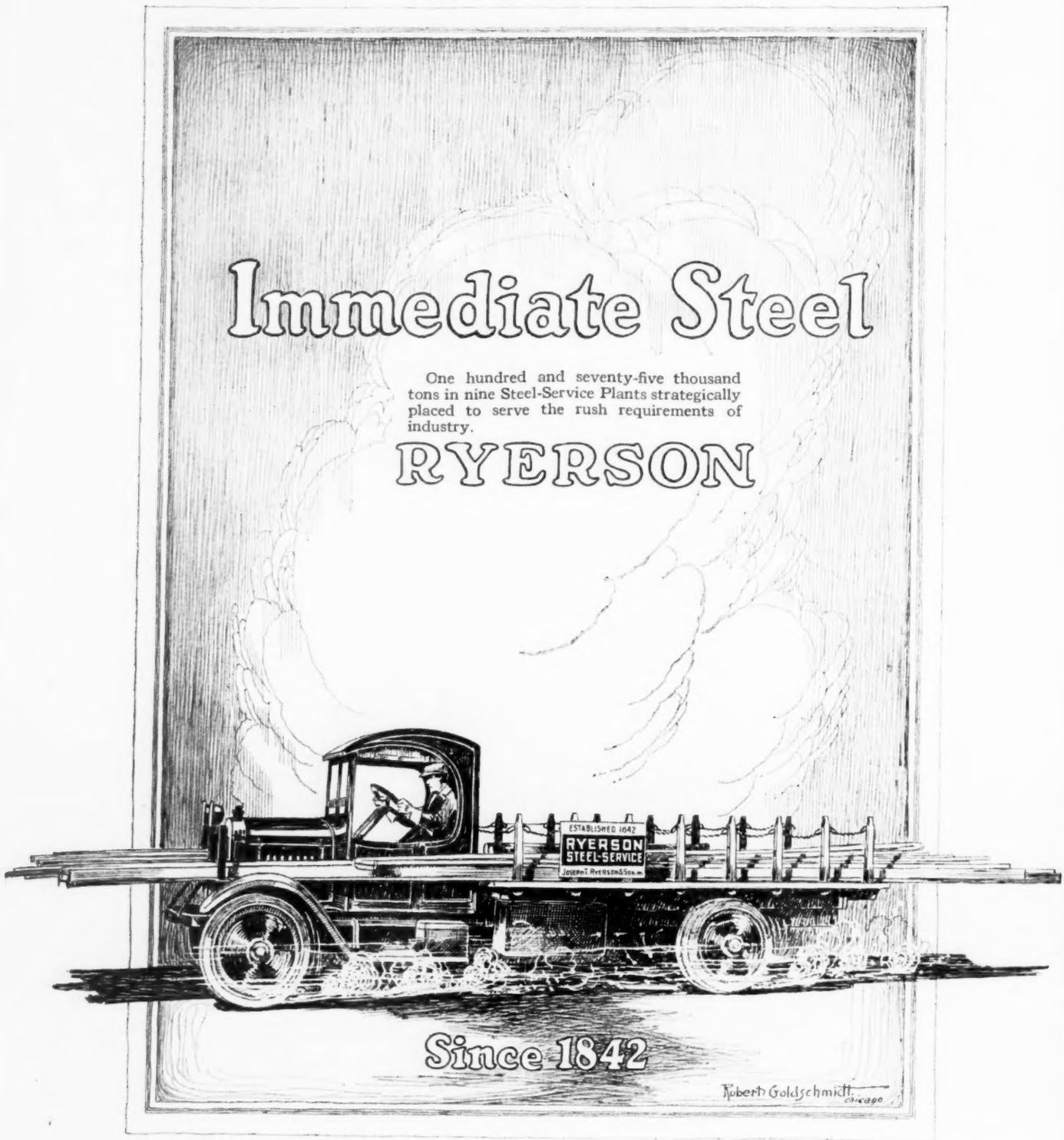


THE first source for the buyer in doubt. . . . The regular source for the buyer who knows. Ryerson Steel-Service plants are located at Chicago, Milwaukee, St. Louis, Cincinnati, Detroit, Cleveland, Buffalo, Boston, Philadelphia, Jersey City.

Volume 87 Number 3

IRON TRADE REVIEW
STEEL

PRODUCTION ◆ PROCESSING ◆ DISTRIBUTION ◆ USE

This Week in Steel

AUTOMOBILE production has slumped this month to the lowest point of the year, but Detroit refuses to believe that the country is going back to buggies. Ford is improving his brakes, transmission and radiator. Chevrolet is substituting wire for disk wheels. New Chrysler eights are due this week, new Buick eights next week, new Packard and new Reo eights soon. Low as automobile common stocks are, the market-wise at Detroit defer accumulation until they come within the range of 1927 quotations. Page 32.

Pittsburgh Minus denotes an inferiority complex, contrasted with the grandiose pretensions of Pittsburgh Plus, humbled six years ago, but the phrase is apt for the state of mind of Pittsburgh over the new short-haul mileage freight rates. A scant 20 square miles is now contained within the limits of the new Pittsburgh switching district; meanwhile, Chicago has 600 square miles, Detroit 180, Philadelphia 125, Cleveland 100. Western Pennsylvania complained vigorously last week to the Pennsylvania public service commission; eastern Pennsylvania has its innings soon. Page 35.

Steel's Dollars Go Farthest Now

True to tradition, the steel industry turns to expansion when its markets are smallest. The American Rolling Mill Co. will spend $1,000,000 additional on its Ashland, Ky., plant. Otis Steel Co. at Cleveland, Michigan Steel Corp. at Detroit, Granite City Steel Co. at Granite City, Ill., all have outlined programs. Spang, Chalfant & Co. are reported planning a new pipe mill at Ambridge, Pa. This is why many heavy equipment manufacturers are busy. Page 36.

Corrosion-resisting steels are flying high. Following in the footsteps of the automotive industry, aircraft manufacturers are experimenting with the highly alloyed steels for structural and engine parts. The wide range of compositions and physical characteristics provides types which appear suitable for a long list of applications. The future holds much promise for wider use of these steels. Page 52.

Even Modernize the Village Smithy

Do you remember how the blacksmith around the corner used to harden steel by heating it in the old forge, then plunging it with

International News Photo

Two such sentinels of steel will support the cables for the new Hudson river bridge at New York. From them will be suspended 107,000 miles of wire. At the top of the tower are cat walks for workmen.

a sizzle in a barrel of water? Once in a while to obtain extreme hardness he would sprinkle a powder on the heated steel, reheat it, then quench. That powder was ferrocyanide. Today, cyaniding is a well-known commercial process, the parts to be surface hardened being immersed in a bath of molten cyanide. Gears, worms, rings, and the like, are given a case which is much harder than a carburized one. Various grades of cyanide are available and each offers certain advantages in the mechanism of hardening. Page 43.

Low Prices Tempting Steel Buyers

These are bargain days in steel. Prospective builders who have been "shopping" for structural material find prices so low they are tempted to buy, and thus this week's shape awards are 50 per cent over the average for the year to date. Steelmakers are not certain that the bottom in scrap prices has been reached, but current levels make moderate purchases attractive. Some steel buyers are signing third quarter contracts, certain they will not be held to them but equally certain if the market should advance they will be protected. Page 77.

Another new use for steel. A western oil company now is replacing wooden runways on tank cars with fabricated steel decking. Although steel costs half again as much as wood, the investment is expected to be returned in reduced upkeep and increased safety. The steel decking is attached by riveting, thereby making a permanent installation. Page 50.

Steel is playing Ring-around-a-rosy in this old world. American steelmakers are giving continental producers close competition in Japan and elsewhere; continental sellers are pressing their products on British markets, to the despair of English. Germany continues to reduce production and is adding steadily to its unemployed. Page 104.

July a 10-Day Month for Steel

Vacation is a horrid word to the steel industry, when its best customers shut down for two weeks, but when the vacation is payless it is even worse on the country's purchasing power. Fully half of the automobile industry is idle the last half of July. The New York Central railroad, with ample equipment in good order, has closed its repair shops two weeks. The annual vacation of the Western Electric Co., with pay, is in progress. Only a portion of the month's layoffs is cited, yet here alone 200,000 persons are idle. Page 28.

When completed, the Kill van Kull bridge connecting Bayonne, N. J., and Port Richmond, Staten Island, N. Y., will have the longest arch span of any bridge in the world. To reduce the dead weight of the span the engineers turned to a wider use of alloy steel. Manganese steel in rolled plates and shapes fabricated with manganese steel rivets has been accepted as the material for the lower chord. About 40 cent of the steel already has been erected. Page 57.

Look out below! Pedestrians using sidewalks adjacent to a skyscraper under construction run a risk of intercepting a misdirected hot rivet or a loosened brick. To afford some protection, contractors are obliged to erect sidewalk bridges with substantial roofs. Steel is finding much favor for these bridges as well as for elevator towers and scaffolding. The various sections are made standard and interchangeable; they can be erected in minimum time; they provide maximum strength, and can be completely salvaged for erection on other jobs. Page 48.

Canada Would Exploit Its Ore

Canada refuses to believe that some force in Nature untold eons ago had foreknowledge of the boundary between the United States and Canada, located all the marketable iron ore south of the line and only low-grade ore north of it. To stimulate interest, Ontario is offering a bounty of 1 cent a unit, has many geological parties in the field, is expanding research into methods of utilizing low-grade ores. With choice Minnesota and Michigan ores facing exhaustion in 25 years, American capital is taking notice. There is no duty on imports of iron ore. Page 26.

Hotels, auditoriums, clubs and similar organizations owning large numbers of chairs frequently are pressed for storage space when the chairs are not needed. Now an enterprising inventor announces a welded steel chair so designed that large numbers of them can be nested. All chairs are duplicated. Page 50.

Youngstown Led by Economic Necessity to Seek Merger

MERGER of Youngstown Sheet & Tube Co., Youngstown, O., with Bethlehem Steel Co., Bethlehem, Pa., was dictated by numerous developments in the steel industry during and since the war, witnesses testified in the hearing of the various suits seeking to prevent this action, now on trial at Youngstown.

Following the long examination of James A. Campbell, chairman of the Sheet & Tube company, in which he outlined his reasons for desiring this move and his actions in seeking to bring it about, the court heard testimony of Henry G. Dalton, stockholder in both companies and a partner in Pickands, Mather & Co., Cleveland; Elton Hoyt II, another member of Pickands, Mather & Co.; and Frank Purnell, president of the Sheet & Tube company.

Depositions also have been presented, containing testimony of John Tod, Youngstown, and Charles M. Schwab, chairman of Bethlehem Steel Co.

Adjournment of court was ordered Tuesday afternoon to allow steel men to attend the funeral of Thomas McDonald, a veteran steel man whose name is perpetuated in the McDonald mills of the Carnegie Steel Co.

Henry G. Dalton

Purnell Cites Merger Motives

Mr. Purnell, recited various conditions which have risen to circumscribe the field of activity of the Sheet & Tube company and which have seemed sufficient to warrant merging its interests with some other steel producer to get better results. These conditions have tended to place the company in a position of competitive inequality. An important change was development of by-product coke ovens since 1917, abolition of the Pittsburgh basing point and competition resulting from over-capacity developed during the war.

Use of by-product coke made possible river transportation of coal and placed river mills on a $2 better footing in the per ton cost of steel. Changes in railroad rates in unequal percentages also was to the disadvantage of Youngstown—the city. Mr. Purnell stated increases in Youngstown freight rates were 60 per cent while that for Pittsburgh was only 39 per cent. Coal and coke rates also he said, gave unfavorable differentials. Abolition of the Pittsburgh basing point, he pointed out, limited Youngstown's competitive radius and present freight rates were adduced to sustain his point.

Ore Contracts Revealed

Competition in the effort to dispose of excess steel resulting from war expansion of capacity resulted in greater diversification of finished products, resulting in close selling. He said that under present conditions Sheet & Tube is confined chiefly to flat rolled steel and pipe. His company sought to diversify products and production of plates and rails on a larger scale was studied, but profitable production of these lines seemed unlikely.

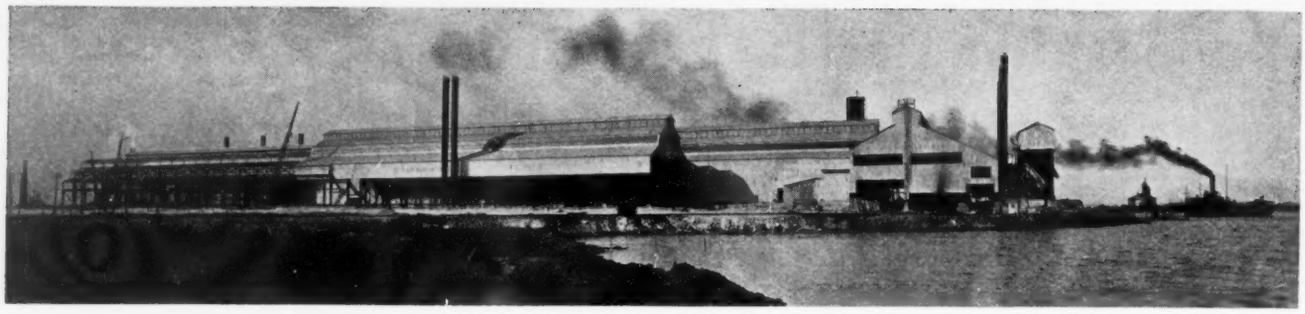
Mr. Purnell's testimony was as a defense witness, though he first was called by the plaintiffs who interrogated him as to papers and data he had prepared regarding the merger.

James A. Campbell

Mr. Dalton testified he owns 11,520 shares of Sheet & Tube common and 1260 shares of preferred stock and 780 shares of Bethlehem. He has been a director of Sheet & Tube for 25 years and also a director for Bethlehem for six or seven years. The members of Pickands, Mather & Co., a partnership, are Samuel Mather, Elton Hoyt II, Frank Armstrong, Samuel E. Bool and himself. Three partners recently died. Harry Coulby, H. S. Pickands and Jay MacLauchlan—and the surviving partners have obligated themselves to take over their former partners' interests.

Under questions by the court and opposing attorneys, Mr. Dalton explained minutely the intricacies of the iron ore business. Then came the introduction of the company's ore contracts with Sheet & Tube, Inland, Bethlehem and others. He testified these contracts have various lengths of life, some as high as 40 years, while others were uncancellable. In the case of one mine, as an example, he testified that Sheeet & Tube paid his firm 6 cents a ton for commission and 4 cents a ton for resale.

While the United States Steel Corp. mines and ships its own ore, yet Bethlehem and Sheet & Tube do not because the ore tonnages involved are not sufficiently large to warrant this. Concerns such as Oglebay, Norton &



GREAT LAKES STEEL CORP. PLANT AT ECORSE, MICH., NEARLY READY

Little more than a year ago the first sand fill was made and 11 months ago, Aug. 14, 1929, the first concrete was poured. Steel will be made about Sept. 1. This illustration shows a general view of mill and soaking pit buildings.

Co., M. A. Hanna Co., Cleveland-Cliffs Iron Co. and Pickands, Mather & Co. can do it cheaper for these independents, or at least more effectively.

While the witness said he favored the first Inland merger because of the terms offered and the possibility of linking up with a concern making rails and structural steel, which Sheet & Tube does not make, he was not active in the second merger with Inland which also fell down. During the negotiations with Bethlehem, he declared he went to New York at the suggestion of Mr. Campbell, his friend for years, and never had any other idea than that he was representing Sheet & Tube. No Bethlehem officer or director had asked him to represent Bethlehem in these negotiations.

Dalton Offered To Resign

He had offered to Messrs. Grace and Campbell to resign as director in their companies, but they said it was not necessary. At the Sheet & Tube directors' meeting when the Bethlehem merger was approved, Mr. Dalton declared he refrained from voting, the merger winning by one vote. Subsequently he admitted he was active in getting votes in favor of the merger, but this was after Mr. Eaton had organized his merger-opposition commitee and "had cast aspersions upon our firm." He said Samuel Mather had favored the Bethlehem merger, but the witness never had heard his brother William G. Mather say he favored it. He said Mr. Campbell early in January had initiated the negotiations with Grace to merge with Bethlehem and the first he knew of it was when Mr. Campbell told him after he had returned from the New York meeting.

Dispute "Largest Holder" Claim

Mr. Dalton testified that "our family" meaning Pickands, Mather & Co. and its affiliations, including the estates of deceased former partners, owns 130,000 shares of Sheet & Tube stock. Including with this the block of 12,000 shares which Samuel Mather gave to Lakeside hospital, Cleveland, this makes a total of 142,000 shares thus owned by the "family." Evidently this was in reply to Mr. Eaton's oft-repeated suggestion at various meetings that he was the largest stockholder of Sheet & Tube. It was testified that Cliffs Corp. owns 125,000 shares of Sheet & Tube in which Mr. Eaton and W. G. Mather have equal shares. Mr. Campbell testified that Mr. Eaton's name does not appear on Sheet & Tube's books as a stockholder, but at the recent annual meeting he and four associates were made directors.

An incident in the course of Mr. Dalton's testimony was the introduction by opposition attorneys of testimony that two checks, each for $400,000, had been sent by Bethlehem Steel to Pickands, Mather & Co., one on March 23 and the other two days later. Mr. Dalton said the entire sum of $800,000 was used to replace funds "used in the ordinary course of business and also to buy Sheet & Tube stock." Within a few days this sum was repaid the Bethlehem company at the suggestion of President Grace that "it might be misunderstood."

Elton Hoyt II told of the meeting in Cleveland, March 11. He testified he first heard of the proposed merger from Mr. Dalton about Feb. 13. He was a stockholder in Sheet & Tube for only a brief time during the stockholders' meeting. He goes to Bethlehem monthly in connection with Pickands, Mather & Co. ore business with Bethlehem Steel Co. At the March 11 meeting, he said, Mr. Eaton sought to have consideration of the merger by the Sheet & Tube board postponed. Mr. Campbell favored the merger and believed it should be put before the stockholders as soon as possible, even though Mr. Eaton had sufficient stock to block the consolidation.

See Third Quarter Car Needs 12 Per Cent Under 1929

A NATIONAL forecast for third-quarter car loadings has just been made by the regional shippers' advisory boards. Carloadings for iron and steel for this period last year totaled 577,102 units, while those estimated for this year are 508,216, a decrease of 11.9 per cent.

Last year's actual carloadings for iron and steel for New England board territory were 7724 cars while the estimated for this year are 6952, declining about 10 per cent. For the Atlantic states board territory the actual iron and steel loadings last year were 89,286 while the estimated for this year is 71,429, a slump of 20 per cent.

Allegheny board territory iron and steel carloadings for last year were 256,709 and the estimated for this year is 237,456, a decrease of 7.5 per cent.

Iron and steel carloadings last year in the Great Lakes board territory was 68,149 while the estimated for this year is 60,653, revealing a drop of 11 per cent. On Ohio valley board territory last year's loadings were 24,548 cars and the estimate for this year at 18,411 units will be off 25 per cent.

Mid-west board territory loadings last year were 74,898, while the estimate for this year is 63,665, a fall of 15 per cent. Northwest board territory iron and steel loadings last year were 3233 cars while this year's estimate is 3100, a decreasing at 4.1 per cent rate. Trans-Missouri-Kansas board territory loadings last year were 6347 while this year's estimate is 5867 shows a shrinkage of 7.6 per cent.

Southeast board territory iron and steel loadings last year were 31,033 cars while this year's estimate is for 26,380 a decline of 15 per cent. Southwest board territory loadings last year were 5461 while this year's estimate is for exactly the same number of cars.

Iron and steel car loadings last year in Central Western board territory were 2430 while this year's forecast is for 2400 cars, a falling off of

1.2 per cent. Pacific coast territory loadings last year were 6140 cars and this year's estimate for 5409 cars shows a decrease of 11.09 per cent. Pacific northwest board territory iron and steel loadings last year were 1144 cars and the estimate for this year is for 1033 cars showing a drop of 9.7 per cent.

Bar Mill Wages Unchanged for July and August

Wage rates in bar mills represented in the Western Bar Iron association are unchanged for July and August. The average sales price of bar iron in May and June was 1.90c a pound. Puddlers will continue to receive $11.30 a ton. Reductions of 25 cents a ton were made at each of the two succeeding bi-monthly settlements. The price average in May and June, however, remained unchanged after two successive decreases. Following is a comparison of the averages:

	1930	1929	19.28
Jan. Feb.	1.95c	2.00c	1.85c
March-April	1.90c	2.00c	1.90c
May-June	1.90c	2.00c	1.90c
July-Aug.	.....	2.00c	1.95c
Sept.-Oct.	.....	2.00c	2.00c
Nov.-Dec.	.....	2.00c	2.00c
Yearly average	.....	2.00c	1.933c

Pipe and Structural Labor Increased in May

Employment in the iron and steel industry in May was 0.1 per cent below that of April, according to final compilations by the bureau of labor. Payrolls decreased 2.4 per cent. May ordinarily shows little change from the April rate in basic manufacturing industries. Employment in cast iron pipe plants increased 0.6 per cent, and payrolls 0.9 per cent. Structural steel plants reported an increase of 0.8 per cent in employment and 0.1 per cent in payrolls. Employment in machine tool plants dropped 2.9 per cent, and their payrolls were reduced 4.5 per cent.

Certificates of Merit To Be Awarded to Workers

Honor awards for craftsmanship are to be a permanent feature in the building industry in Chicago. Forty mechanics, including structural steel workers, who made an especially good record in their work on the new Board of Trade building, are to be presented with citations of merit by the Architects' club at a formal ceremony in the rotunda of the building some time this month. Employes are to be encouraged, with the expectation of creating better labor conditions in the building industry. A similar plan was tried in Detroit several years ago.

Pittsburgh Claims Switching District Too Cramped

PITTSBURGH'S switching district under the mileage rates effective May 20 by decree of the interstate commerce commission is reduced to an area of 20 square miles, while for all practical purposes the Chicago district includes 600 square miles, Detroit 180, Cincinnati and St. Louis each 150, Philadelphia 125 and Cleveland 100.

Largely on this situation is predicated the case of Pittsburgh district steel producers and shippers against the new short haul rates, and protest was vigorously lodged at the hearing at Pittsburgh, July 9-11, before the Pennsylvania public service commission. Hearings will be resumed shortly, probably at Harrisburg, Pa., to consider the situation in eastern Pennsylvania. The suggestion for a 60-day truce was rejected because of the question of reparation in case reductions are ordered.

About 40 witnesses presented the case for the Pittsburgh district at last week's hearing. Steel producers intimated that the increasingly excessive freight burden imposed in the Pittsburgh district was forcing production westward.

John A. Coakley, Cleveland, vice president and general traffic manager, American Steel & Wire Co. testified that although his company had $50,000,000 invested in its Donora, Pa., plant and normally employed 6500 persons there, future development awaited relief from the rate situation.

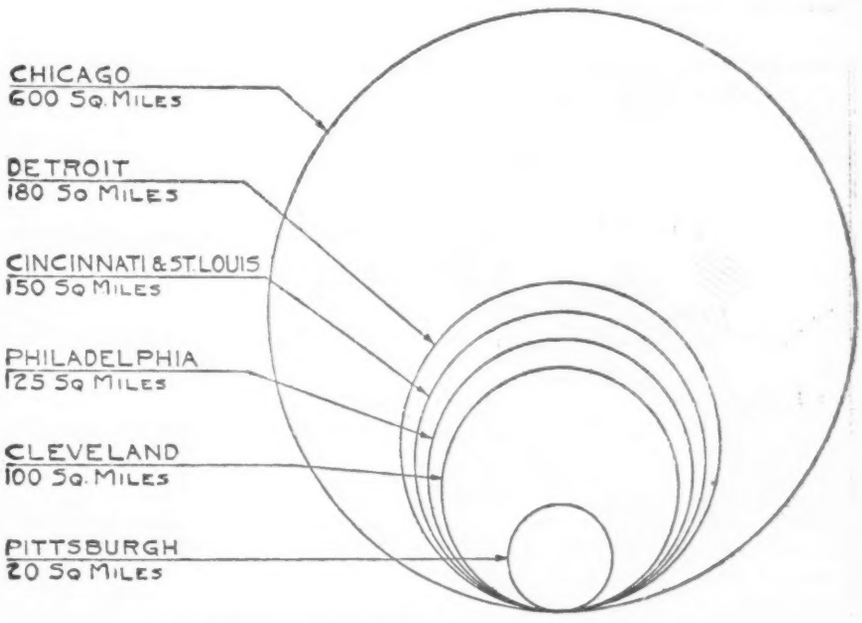
F. A. Ogden, Pittsburgh, general freight agent, Jones & Laughlin Steel Corp., declared that about 2000 cars of freight usually handled each month between the corporation's South Side and Aliquippa plants would have to be diverted to the rivers.

Railroads chiefly involved in the Pittsburgh district situation claim they will lose about $5,000,000 annually in revenue due to application of the new mileage rates, but about half will be recouped by the advances in short haul rates in the Pittsburgh district, according to shippers.

The matter of reparation becomes important. One steel interest states its freight bills are swollen $30,000 a day by the mileage rates and hence is pressing for a speedy adjustment.

Highland May Not Move

Highland Iron & Steel Co., subsidiary of the American Chain Co. and operating a bar iron mill at Terre Haute, Ind., will defer 60 to 90 days a decision on removing the plant owing to an unfavorable freight rate situation. Officials of the company expect the Indiana public service commission will adjust rates satisfactorily. Operations have been resumed.



HOW PITTSBURGH MINUS OPERATES

Interstate commerce commission mileage rates, which Pittsburgh is protesting, cuts down the switching district to one-thirtieth of Chicago. Comparisons with other cities also are shown.

Bounty Stimulates American Interest in Canadian Ore

INVESTIGATIONS now under way are to decide the age-old question of whether Canada has sufficient iron ore to be of interest to iron and steel manufacturers. Canada's iron ore has been an enigma ever since the discovery of vast deposits on the American side of the boundary in the Lake Superior region. It never seemed reasonable that Nature could be so generous on one side of the line, and so penurious on the other, except to geologists who knew the formation.

Many Reports Disproved

From no other country on the globe has come so many and persistently encouraging reports of "finds," to be promptly disproved. American ore and steel interests have repeatedly followed up "leads," only to be disappointed. Scarcely a ton of iron ore for use in blast furnaces has been mined on a commercial basis in the province of Ontario in the past eight years. Three small mines once in operation there produced a total of 4,000,000 tons of ore.

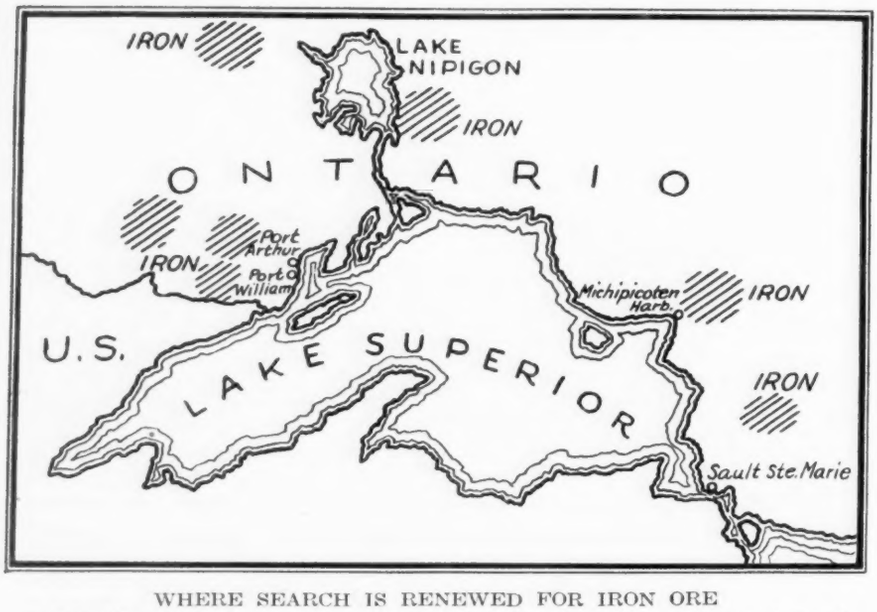
Now the Ontario government has provided a bounty of 1 cent a unit on ore mined in the province. This means that if any one mines a ton containing 50 per cent iron the government will present him with 50 cents, in addition to the profit he can make on the sale of the ore. There are known to be large deposits of lower grade ore in the province and the government hopes to stimulate efforts to mine and concentrate it. Further, it is sending geologists and mining engineers into the field, and experimenting with concentrating methods, with a view to helping private enterprise.

According to reports from Toronto the Bethlehem Steel Co. was among those to start explorations recently. Property in the Michipcoten area was drilled and some ore was shipped for testing. The latest information is that the presence of heavy content of arsenic in the drill cores has made it advisable to proceed cautiously in arriving at a decision as to its ultimate use.

Useful for Other Purposes

The duPont interests have been surveying the iron pyrites deposits in Ontario. Pyrites, or iron sulphide, contains 46.7 per cent iron and 53.3 per cent sulphur, and is used largely in the manufacture of sulphuric acid. The residue is called "blue billy" and contains about 50 per cent iron and 3 to 5 per cent sulphur. Large tonnages of this by-product are available at times at sulphuric acid plants in Ontario, Chicago and elsewhere, but it is not satisfactory for use in blast furnaces because of the high percentage of sulphur. It must be further treated, or used in small quantities with other ore.

The Ontario iron ores are low grade and complex. The future development of the region depends mainly on the beneficiation of the carbonates in the Michipicoten district and the magnetites of the Moose Mountain area. American companies, now conducting a widespread search for ore, may in time make these useful to steel manufacturers. The Canadian Mfg. Co. Ltd., Welland, Ont., has done some experimental work on electric furnaces for the direct reduction of ore and has succeeded in making sponge iron without the use of carbon, by melting the iron content of the ore wthiout affecting the impurities. This development, however, has not been as rapid as anticipated since the first announcement of plans.



WHERE SEARCH IS RENEWED FOR IRON ORE

Scientific methods are being substituted for haphazard "prospecting" in the northern division of the province of Ontario. The government's offer of a liberal bounty is attracting American ore producers.

Great Northern Leases More Iron Ore Properties

Mines of the Great Northern Iron Ore Properties shipped 11,040,152 tons in 1929, or 16.6 per cent of all shipments from the Lake Superior district, according to the proprietary companies' annual report just issued. The increase over 1928 was 2,348,112 tons.

The report discloses that on May 1, 1930, the trustees concluded negotiations for leasing a large tonnage of ore in lands in St. Louis county, Minn., to Pickands, Mather & Co., Bethlehem Steel Corp., and Youngstown Sheet & Tube Co. It also leased a tract of ore land adjoining the Wheeling mine to the Wheeling Steel Corp. Mention also is made of leases of six properties to the Hanna Iron Ore Co., subsidiary of the National Steel Corp., as outlined in this publication Jan. 2.

"These leases will substantially add to the earnings of the proprietary companies," the report states. "Further lease negotiations are under way."

The distribution to holders of certificates of beneficial interest in 1929 amounted to $4,875,000, or $3.25 per share, compared with $4,125,000, or $2.75 a share, in 1928.

Production Index Down

The iron and steel production index in May was 111, compared with 114 for April, taking 1923-1925 as 100, according to the department of commerce. The index for May, 1929 was 145. The nonferrous metals index in May was 101, compared with 105 for April, and 137 for May last year. Automobile production in May was 104, against 109 for April and 148 for May, 1929.

The index of unfilled iron and steel orders in May was 80, compared with 87 for April, and 87 for May last year.

Industrial Men in the Day's News

Hayward G. Niedringhaus, President, Granite City Steel Co., Granite City, Ill.

AT 37 he follows his father in charge of the steel business founded by his grandfather and the latter's brother.

FROM chemical laboratory to president's chair, through various promotions in the producing department, has been his course for 19 years.

APPOINTED vice president and general manager of the steel interest and vice president of National Enameling in 1927, he recently relinquished the latter office.

THIRD generation of his line to direct the affairs of Granite City Steel Co., Granite City, Ill., Hayward G. Niederinghaus has been a steel man all his life. His recent election to the presidency was noted in *Iron Trade Review* of June 26. The honor comes to him at 37 years, making him one of the youngest executives in the steel industry. He succeeds Alfred J. Kieckhefer, president of National Enameling & Stamping Co., Milwaukee and St. Louis, an affiliated interest. Mr. Kieckhefer remains on the directorate of the Granite City Steel Co.

Mr. Niedringhaus' affiliation with the two companies dates back 20 years but he resigned a short time ago as vice president of National Enameling, remaining on its executive board. The Granite City Steel Co. formerly was part of National Enameling but the two have maintained separate entities for about three years.

In preference to attending college, Mr. Neidringhaus entered the business founded by his grandfather, the late William F. Niedringhaus. His father, the late George W. Niedringhaus, and his grandfather founded the town of Granite City and developed it into an important industrial community.

Beginning in 1910 Mr. Niedringhaus spent three years in the chemical laboratory department, following which he held various positions in the producing department. In 1923 he was made managing director of the steelworks branch of National Enameling & Stamping Co., and in 1927 vice president and general manager of the steel company and vice president of National Enameling. In June of this year he was made president of the steel interest.

Mr. Niedringhaus is a director of Mississippi Valley Trust Co., St. Louis; Granite City National bank, Granite City, and is a member of the St. Louis Country club and the Racquet club.

LSELMI and Charles H. Flickinger have resigned as metallurgical engineer and chemist, respectively, Corrigan, McKinney Steel Co., Cleveland. The former will become metallurgical engineer, Great Lakes Steel Corp., Detroit, and the latter, its chief chemist. Mr. Selmi has been with the Corrigan, McKinney company since it started to operate in 1915. He received the doctor of chemistry degree from Royal university, Modena, Italy, and later graduated at Royal Polytechnic institute, Milan, Italy.

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Frank Grossman has been appointed special representative, Glamorgan Pipe & Foundry Co., Lynchburg, Va., with headquarters at 812 Peoples Gas building, Chicago. He has been identified with cast pipe for many years.

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Eugene A. Balsley, for the past two years vice president and general superintendent, Wheeling Mold & Foundry Co., Wheeling, W. Va., has resigned to enter business for himself in Wheeling, manufacturing a number of specialties for foundry use.

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J. Lester Williams, formerly vice president and secretary, Chicago Nipple & Mfg. Co., Chicago, has been elected president to succeed the late D. C. Williams. J. Lester Williams Jr. was named vice president and secretary to succeed his father. The younger Mr. Williams also was named a director.

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Charles Armstrong has been appointed general manager of Clegg Lock Washer Corp., 4725 West Lake street, Chicago. Mr. Armstrong was a captain of engineers in Russia during the war and later was connected with *Chicago Journal of Commerce*. He also has been business manager of the Textile Trade and Bag association. George H. Anderson is president of the Clegg company.

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R. L. Herman, formerly transportation manager, southwestern district,

Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., has been made heavy traction representative, with headquarters in New York. He was graduated from the University of Illinois in 1915, and with the exception of three years in United States army service, has been in the continuous employ of the Westinghouse company since that date.

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Thomas L. Feeney has been named president of the Tool and Die Makers' association of Toledo, O., incorporated at Columbus, O., July 3.

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W. H. Carrick, safety engineer, Corrigan, McKinney Steel Co., Bessemer, Mich., was elected president of the Lake Superior mining section National Safety council, at the twelfth annual conference at Duluth, recently.

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H. D. Carlton resigned July 3 as president of Consolidated Ashcroft Hancock Co. Inc., Bridgeport, Conn., steam gages, valves, etc. He also has resigned as vice president of Manning, Maxwell & Moore Inc., New York, machine tools.

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John A. C. Warner, who has been with the Studebaker Corp., South Bend, Ind., since November, 1926, has returned to the Society of Automotive Engineers, having been appointed secretary and general manager to succeed the late Coker F. Clarkson. C. B. Veal has been appointed his assistant.

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Walter B. Minch, manager, Jaxon Steel Products Co., Jackson, Mich., while it was part of General Motors Corp., Detroit, will continue in that capacity for the east end division, now that it has been purchased by Kelsey-Hayes Wheel Corp., Detroit. Walter F. Rooney continues as manager of the west end plant and Glenn A. Sanford, formerly sales manager, Jaxon Steel Products Co., has become affiliated with the Kelsey organization.

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W. B. Montgomery, assistant controller, Colorado Fuel & Iron Co., Denver, has been promoted to controller, succeeding Harold I. Butt, now assistant to Arthur Roeder, president. In order to co-ordinate the work of executives, headquarters of W. A. Maxwell Jr., vice president in charge of plant operations, Pueblo, Colo., have been removed to the main office, Continental building, Denver.

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A. M. Maddock has been appointed vice president and sales manager, eastern division, Standard Sanitary Mfg. Co., Pittsburgh, plumbing fixture manufacturer, a division of American Radiator & Standard Sanitary Corp., New York; H. F. Beglen becomes vice president and sales manager, central division; F. A. Kales is vice president and sales manager, western division; R. L. Ottke, vice president and sales manager, brass division, and C. B. Nash, vice president and director of publicity, the latter two with headquarters at Pittsburgh. These vice presidencies are newly-created.

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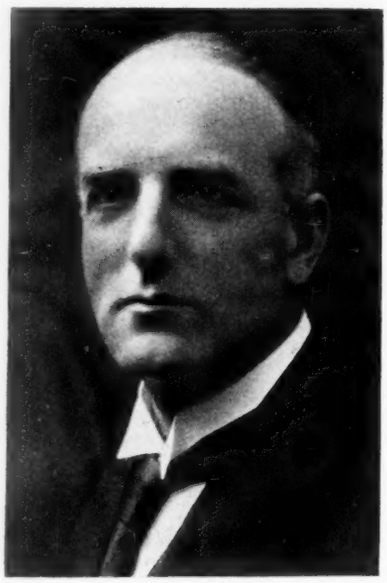
A. Harley, for 20 years foundry manager, Daimler Co., Coventry, England, was recently elected senior vice president of the Institute of British Foundrymen. Mr. Harley is a native of Falkirk, Scotland. He was trained as metallurgical chemist in the laboratories of Carron Co., Caroon, Sterlingshire, and later, for about two years, he was associated with the Alloa Coal Co., Alloa,



A. Harley

Clackmannanshire. He then became affiliated with Coalbrookdale Co., Shropshire, as assistant general manager, holding that position for nine years, after which he supervised the erection of Daimler Co.'s new foundry, of which he became manager. He also has had charge of the general laboratories and the heat treating department for about eight years. He has been a member of the Institute of British Foundrymen for 20 years and is a past branch president.

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James R. White, for nearly three years secretary and sales promotion manager for Jenkins Bros., Bridgeport, Conn., manufacturers of valves, packing and mechanical rubber goods, with factory also at Elizabeth, N. J., has been elected vice president and director of sales. A native of Detroit, Mr. White, previous to the World war was connected with a newspaper in that city. After leaving the service, he went with Rickard & Co. Inc., New York, advertising director, remaining nine years before becoming affiliated with Jenkins Bros. He will continue secretary of the latter organization.

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John E. Garrity, for the past 15 years sales manager of the West Leechburg Steel Co., Pittsburgh, has resigned. He has been in poor health for several years and has made no new business affiliations. Mr. Garrity had been identified with the West Leechburg company for nearly 20 years. He has been succeeded as sales manager by M. F. Findley, connected with the company for the past 23 years and for the past five years sales manager in the Detroit district.

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P. H. Noland, for about a year vice president of Minneapolis Moline Power Implement Co., Minneapolis, and Moline, Ill., has been appointed assistant general manager, Marmon Motor Car Co., Indianapolis. For eight years he was vice president in charge of sales, Moline Implement Co., and before the World war was European manager of John Deere & Co.

E. C. Badger, recently named treasurer, Marmon Motor Car Co., becomes vice president in charge of manufacturing.

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L. E. Crandall, who resigned as general sales manager, Simmons Hardware Co., St. Louis, in 1924, and who for six years since has been connected with hardware manufacturers, returned to the Simmons company as vice president and general sales manager, July 15.

July Features Large Group Vacations in Industry

Industry is on vacation. Attributable in part to general business conditions, work completed ahead of schedule and endeavor of employers to avert unemployment, probably the greatest industrial vacation exodus on record comes this month. Among many large consumers of steel products, July will do well to average ten working days.

About 50,000 employes of Western Electric Co., Chicago, left work last week for a simultaneous two-week vacation, including 30,000 at Hawthorne works, Chicago, 17,000 at Kearny, N. J., 2000 at Baltimore, and 8000 scattered. About 97 per cent are receiving their off-time with pay.

To continue with balanced organizations in the New York Central railroad line shops and avoid further force reduction, the company has arranged for heavy repair shops to be closed for ten working days. The decision affects a dozen

plants and several thousand workers. The Nickle Plate is asking employes to work two days of the month without pay.

Detroit and the automotive industry list foremost in importance Ford's two-week shutdown this month. Packard, Graham, Oakland-Pontiac also are down. Chrysler is following employe vacation in rotation with a general 10 per cent wage cut. Automotive parts makers generally have the vacation sign hung out, including Motor Products, Timken Axle, Midland Steel Products and Auto Specialties, and Transue & Williams.

Fort Pitt Bridge to Buy Massillion Bridge

Negotiations are reported under way for acquisition of Massillon Bridge & Structural Co., Massillon, O., by Fort Pitt Bridge Works, Pittsburgh. The former interest, of which E. Rice is president, H. F. Dielhenn vice president, C. D. Yost secretary-treasurer, and D. L. Gregory superintendent and general manager, has a capacity of approximately 3000 tons monthly of structural and bridge work. Its fairly-modern plant is located on the Pennsylvania and Baltimore & Ohio railroads at Massillon. Fort Pitt Bridge Works declined to issue a statement at this time except that merger details were not yet complete.

Foundry Equipment Groups Are To Be Organized

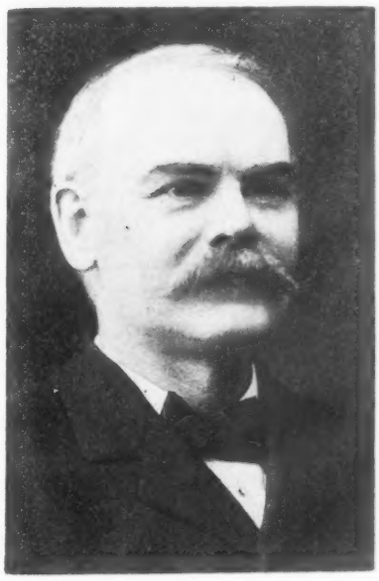
Foundry Equipment Manufacturers association, Cleveland, has decided in the light of recent business developments to proceed at once with the organization of groups covering the various divisions of foundry equipment. The sand preparation and material handling group held a preliminary meeting in Chicago, June 10, and a second meeting of that group and meetings of the molding machine and sandblasting and dust collecting group will be held at the Hotel Cleveland, Cleveland, July 22. At that time permanent organizations for the various groups will be perfected.

Copperweld Sales Record

Copperweld Steel Co., Rankin, Pa., manufacturer of electrical supplies, reports that its sales for the first six months of 1930 were the largest in its history, being 13 per cent above the sales for the same period in 1929. Shipments are reported at 15 per cent above those for this same period last year. An order for 3,000,000 feet of wire has been sold to the government.

Obituaries

THOMAS McDONALD, 82, who retired in 1916 as general superintendent, Youngstown district, Carnegie Steel Co., Pittsburgh, died July 12 in a Youngstown hospital, after an illness of two weeks with kidney trouble. He is generally credited with having inaugurated steelmaking in the Mahoning valley, becoming general manager of the Ohio works at Youngstown, for the Carnegie company in 1894. He previously had had an active career at that interest's Duquesne works, Pittsburgh. He entered the employ of the Carnegie Steel Co., Braddock, Pa., in



Thomas McDonald

1875 as a carpenter but four years later became a turn foreman in the bessemer department. Following his retirement in 1916 his services were retained for considerable time as advisory manager. He was a friend and confidant of the late Andrew Carnegie and he was honored by the United States Steel Corp. when the McDonald Works at McDonald, O., was named after him.

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Levi Rasco, 82, inventor of several patents used by Whitin Machine Works, Whitinsville, Mass., and for 50 years foreman of the plant, died July 11.

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Ernest A. Konzelman, former president of the Buffalo engineering and contracting firm bearing his name, died last week in Pittsburgh. He relinquished the operation of the company a year ago. Burial was at Buffalo.

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Franklin H. Coney, 72, a leading structural consulting engineer, of Chicago, died July 10. Mr. Coney specialized in concrete and steel construction. He collaborated in the building of a number of theaters and office buildings in the Chicago loop.

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Herman Dreses, 76, who retired seven years ago as head of the Dreses Machine Tool Co., Cincinnati, which he founded in 1896, died in Soest, Germany, July 8. Before organizing his own company he was chief engineer for the Lodge & Shipley Machine Tool Co., Cincinnati.

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Harry S. Vrooman, 66, widely known in the foundry industry and among foundry supply interests, died recently. For about 33 years Mr. Vrooman had represented various foundry supply companies, in Chicago, but in recent years had specialized in the sale and distribution of molding sands there. Mr. Vrooman was a native of Indianapolis, but at 17 located in Bloomington, Ill., where following the occupation of his father, he was employed as a molder by Bloomington Stove Co. for about ten years. He removed to Chicago more than 30 years ago and joined the sales organization of Garden City Sand Co., with which company he was connected for a number of years.

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Frank P. Botsford, assistant ore mine manager in Minnesota for Pickands, Mather & Co., Cleveland, died in Hibbing, Minn., July 4. Burial was at Houghton, Mich. He was born in L'Anse, Mich., in 1878 and graduated in 1900 from Michigan College of Mines, now Michigan College of Mining and Technology. He entered the employ of Pickands, Mather & Co., in 1901 as engineer on the eastern Mesabi range.

National Steel Earns $6.07

The 1929 report of the National Steel Corp., Pittsburgh, delayed on account of the formation of the corporation through merger of the Weirton Steel Co., Grand Lakes Steel Corp. and certain portions of the Hanna interests of Cleveland, shows net earnings for all companies in 1929 of $12,573,683.20 after all charges for depreciation and depletion, interest, taxes, etc. equivalent to $6.07 per share on the 2,072,000 shares issued or to be issued under the organization plan. This does not include any earnings from the Great Lakes Steel Corp.

Aluminum used in aircraft engines amounts to 50 to 60 per cent of the total engine weight.

Here and There in Industry

HARBISON-WALKER REFRACTORIES CO., Pittsburgh, has purchased properties in Clearfield county, Pa., of United States Refractories Corp., Mt. Union, Pa. This property will give Harbison-Walker an increase in annual capacity of about 12,000,000 first quality fire brick. The purchase is in addition to other improvement work planned to be started shortly. Extensive improvements have been carried on during the past several years, a major portion being the construction of tunned kilns for burning fire brick. New plant facilities in 1929 involved $1,483,071.

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Higley Machine Co., South Norwalk, Conn., manufacturer of metal sawing machines has moved its general offices to 52 Vesey street, New York.

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Union Steel Products Co., Adrian, Mich., George E. Dean president has taken over the Roberts Portable Oven Co., Chicago, and will move its production to the plant at Adrian.

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Patterson Tool & Supply Co., Dayton, O., has elected William Blake Patterson its president and treasurer, F. S. Patterson vice president, and M. L. Patterson secretary.

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Prest-O-Lite Co. Inc., 30 East Forty-second street, New York, has opened a plant at Casper, Wyo., for the manufacture and distribution of dissolved acetylene.

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Fuller Lehigh Co., Fullerton, Pa., manufacturer of pulverized coal firing equipment and water-cooled furnace walls, has opened a sales office in the Candler building, Atlanta, Ga., in charge of J. McC. Hill.

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Murray Tool & Supply Co., Cleveland, Okla., has moved its sales office, at Tulsa from 222 East Brady street to the Philtower building. Claude M. Murray is vice president and general manager.

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Wagner Electric Corp., St. Louis, has combined its sales office and service station at Atlanta, Ga., and has housed it in a new building at 14-20 Alexander street N. W. Personnel of the office will be unchanged.

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Ajax Pipe Line Co., Tulsa, Okla., has awarded a contract to Oklahoma Contracting Co. for laying and welding its 10-inch oil line from Glen Pool, Okla., to St. Louis. Oxweld Acetylene Co., New York, will furnish welding equipment.

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Detroit Seamless Steel Tubes Co., Detroit, C. H. Hobbs president, is celebrating the thirtieth anniversary of its founding.

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Corporate Steel Products Ltd., Toronto, Ont., which controls Western Steel Products, Winnipeg, Man., with seven factories in western Canada, has bought the roofing sheet metal business of Heather & Little, Toronto.

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Foote Bros. Gear & Machine Co., Chicago, has received an order for graders and road machinery from the highway department of North Carolina, and for four tractors from New York City for street and road construction.

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Wyatt Metal & Boiler Works, Dallas, Tex., has opened a sales office at 15 Park Row, New York, in charge of George E. Gude Jr. Export sales and domestic sales for eastern territory will be under supervision of this office.

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Caldwell Foundry & Machine Co., Birmingham, Ala., has added $50,000 to its life insurance coverage of employes, making a total now of $150,000. The policies are written by the Metropolitan Life Insurance Co. The insurance is co-operative, employer and employes sharing the cost.

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Majestic Household Utilities Corp., Chicago, has nearly completed installation of equipment totaling about $1,000,000 at its new reffigerator plant in Chicago. While some of the refrigerators have been manufactured, mass output will not be under way until about Aug. 1.

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Continental Can Co., New York, has established southern sales headquarters at New Orleans, in charge of J. F. Fenn, division sales manager. J. M. Porter, formerly with U. S. Can Co., Albany, Ga., recently absorbed by Continental Can Co., becomes district manager with New Orleans headquarters.

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Fuerst-Friedman Co., of Cleveland, dealer in electric power machinery, has been made distributor for Diehl Mfg. Co., Elizabethport, N. J., electrical division of the Singer Mfg. Co. Addition of this line of motors enlarges the range of requirements the company can supply in power units.

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Phillips Petroleum Co., of Bartlesville, Okla., has placed an order with Clark Bros. Co., Olean, N. Y., for eleven 200-horsepower engine compressors, direct connected type, for installation at its Hobbs, N. Mex., plant now under construction. It recently ordered 21 similar units for its Pampa, Tex., plant.

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Williams Bros. Foundry, Elkhart, Ind., has bought the Stanley Foundry Co., Grand Rapids, Mich., and will operate it as a branch to supply brass and aluminum castings to customers in the Michigan area. The Elkhart foundry specializes in musical instrument parts and the Grand Rapids branch will be devoted to building and furniture hardware.

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Canadian Westinghouse Co., Hamilton, Ont., has been awarded a contract for electrical equipment for power development at Chats Falls, Ont., on the Ottawa river, on which work has been proceeding for some time. The development is being undertaken jointly by the Ontario hydroelectric power commission and a private Montreal company which owns the site on the Quebec side of the river.

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Cities Service Gas Co., Bartlesville, Okla., has let a contract to Cooper-Bessemer Co., Mt. Vernon, O., for enlargement of pump stations on its Panhandle Texas-Kansas City line, including new stations at Drumright and Blackwell, Okla. Equipment ordered consisted of twenty-four 1000-horsepower direct connected engine compressor units and four 190-horsepower generating units as auxiliary equipment.

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Burke Stoker & Mfg. Co., 917 West Nineteenth street, Chicago, recently incorporated with $100,000 capital, has taken over the entire stoker business of the Burke Engineering Co., Holland, Mich., and continues its manufacture at the Chicago plant. Emil W. Ritter is president and sales engineer, Samuel L. Arson vice president in charge of installation, John Vennema secretary and counsel, and Thomas Olinger treasurer and general manager. The company manufactures furnaces, traveling chain grates and underfeed stokers for plants up to 600 horsepower.

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Stover Signal Engineering Co., 252 Milwaukee street, Milwaukee, has changed its corporate title to Instant-

Freeze Corp. Originally the concern manufactured automobile signals, tail-light and stop-light combinations, but since moving to Milwaukee it specializes in the manufacture of metal household specialties and metal stampings. T. B. Inglis is secretary.

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Trackson Co., division of the George H. Smith Steel Casting Co., Milwaukee, has started production in its new plant at Chase and Holt avenues, and a force of more than 100 is at work. Furnaces and other equipment for the heat treating department is being installed and full operations will be under way before the end of July. The division manufactures crawler attachments for tractors and makes a variety of tractor implements for the construction industry. Walter H. Stiemke is vice president and general manager.

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Harnischfeger Corp. of Canada Ltd., recently established with headquarters at Ottawa, Ont., has opened an office at 504 Dominion Square building, Montreal, Que., with L. P. Deephouse district manager. It is the Canadian distributor for the line of overhead traveling cranes, hoists and excavating equipment manufactured by the Harnischfeger Corp., Milwaukee.

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Westinghouse Electric International Co. has joined a Spanish financial and industrial group in forming the Constructora Nacional Maquinaria Electrica. Westinghouse International is a subsidiary of Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. The new company is capitalized at 12,000,000 pesetas ($2,300,000) to manufacture electric generators, motors, transformers and other electrical apparatus in Spain. It will collaborate with the Westinghouse International and Le Materiel Electrique S-W, the French company formed recently by Schneider-Creusot and Westinghouse interests. These arrangements provide the Spanish company engineering, manufacturing and research information, and exclusive patent rights for Spain. Seventy-five per cent of its stock has been subscribed by a Spanish group and the remainder of its French and American associated companies.

Rolling Mill Prominent in Expansions Announced

Steel producers show their disposition to recognize in present conditions the most advantageous time for starting plant improvements in anticipation of increased demands upon business recovery.

Among authorized extensions is the American Rolling Mill Co. appropriation of $1,000,000 for improvements at its Ashland, Ky., plant, to be begun at once in addition to the regular appropriation for the year 1930 of $1,000,000. Granite City Steel Co., Granite City, Ill., will spend about $500,000 largely for furnaces of new design for its rolling mill. A structural steel steam generator will be completed for the producing department in the fall. Michigan Steel Corp., Ecorse, Mich., will rush work on the superstructures of new roughing and pickling buildings in its plan to increase capacity 30 per cent.

Ajax Steel Tube Corp., formerly Wheeling Tube Co., Wheeling, W. Va., now completing a seamless tube plant, has increased capitalization from $200,000 to $250,000 and changed its name to Ajax Steel Tube Corp. Otis Steel Co., Cleveland, has announced expansion to include a continuous rolling mill, extension to blooming mill, three additional furnaces and six stands of mills.

Reports say a group of Vancouver, B. C., men and Detroit capitalists will take over the Coast Range Steel Co., Vancouver, and with nominal capitalization of $23,000,000, steel producing capacity will be established. Prominent also among rumors is the reported Spang, Chalfant & Co. proposal to erect a $2,000,000 electric-weld pipe plant at Ambridge, Pa.

New York Shape Awards Below 1929, Above 1928

Structural steel awards in the first half year in the New York metropolitan area were below the comparable period of 1929 but ahead of 1928, according to the New York structural steel board of trade. Engineering projects and subways are not included in the following comparison:

Month	1930 Tons	1929 Tons	1928 Tons
Jan.	34,951	27,626	30,204
Feb.	38,535	24,609	24,850
March	28,943	72,003	32,299
April	26,726	37,543	28,214
May	58,431	34,575	46,002
June	49,943	47,299	38,600
Total (6 mos.)	237,529	243,655	200,169

Overhead Crane Shipments in June Show Decrease

June shipments of overhead cranes were reported at 92 units with a tonnage capacity of 1434½ and a value of $956,366.85, according to compliations of the Electric Overhead Crane institute. This represented a decrease in number and tonnage but an increase in value on May shipments which were 100, with tonnage capacity of 1508½ and valued at $879,942.31.

New orders for June were about even with May, 71 for the former and 72 for the latter. Tonnage capacities were identical for the two months at 1239. Valuation of new bookings in June was $740,866.70, somewhat over the May figure of $595,855.

Unfilled orders were fewer on July 1 than on June 1, 237 compared with 263. Tonnage capacities of these orders were 5729 for July 1 and 5754 for June 1. Corresponding values were $3,249,264.03 and $3,490,074.18.

Steel Bookings Drop Small

Unfilled orders of the United States Steel Corp. declined 2 per cent in June, the smallest loss in three months. Tonnage on the books June 10 at 3,968,064 tons is the least since the close of September, 1929, as shown:

Date	Total	Change, tonnage	Change, per cent
1929			
Jan. 31	4,109,487	132,775+	3.34+
Feb. 28	4,144,341	34,854+	0.84+
Mar. 31	4,410,718	266,377+	5.70+
April 30	4,427,763	17,045+	0.38+
May 31	4,304,167	123,596—	2.88—
June 30	4,256,910	47,257—	1.10—
July 31	4,088,177	168,733—	3.90—
Aug. 31	3,658,211	429,966—	10.50—
Sept. 30	3,902,581	244,370+	6.68+
Oct. 31	4,086,562	183,981+	4.71+
Nov. 30	4,125,345	38,783+	0.95+
Dec. 31	4,417,193	291,848+	7.74+
1930			
Jan. 31	4,468,710	51,517+	1.20+
Feb. 28	4,479,748	11,038+	0.25+
Mar. 31	4,570,653	90,905+	2.03+
April 30	4,354,220	216,433—	4.73—
May 31	4,059,227	294,993—	6.78—
June 30	3,968,064	91,163—	2.24—

Machine Tools at Low Levels

Index of net orders for machine tools fell to 121.4 in June compared with 135.1 in May. Total 3-month average of gross orders, according to the National Machine Tool Builders' association, Cincinnati, shrank to the lowest level since December, 1927:

1929	*Index A	*Index B	*Index C	*Total
June	315.6	308.4	346.4	315.2
July	296.2	284.6	324.6	294.8
Aug.	284.2	279.7	272.6	286.1
Sept.	268.5	258.6	252.3	265.8
Oct.	295.4	263.0	269.0	287.0
Nov.	250.8	235.7	261.2	247.2
Dec.	224.0	212.7	258.3	222.1
1930				
Jan.	173.8	171.9	226.8	175.4
Feb.	170.3	169.1	213.6	172.6
March	172.8	184.0	219.7	177.8
April	167.6	197.7	214.4	176.8
May	155.2	191.2	195.3	165.1
June	137.6	171.6	169.4	146.7

*Note—Index A, base over $50,000; Index B, base $10,000 to $50,000; Index C, base less than $10,000. Base: average shipments for years 1922-23-24. Totals: The total of all reports is not an average of A, B and C, but the sum of each item in percentage of the total base.

MIRRORS of MOTORDOM

DETROIT

JULY has been written off as a total loss by the automobile industry. Those manufacturers not down for a fortnight or longer for so-called vacations have curtailed drastically, and sentiment is as low, although less gloomy on the long pull, as at the depths of last fall.

This month's production will be the poorest since January, and may easily slump below the 275,507 passenger cars and trucks assembled in the United States in that month. Compared with an estimated 340,000 to 350,000 units for June, current output shows a decline of about 30 per cent; from the 500,840 units of last July it is a shrinkage of 50 per cent.

Less steel and fewer parts are being shipped into the Detroit area than since last November and December. To unearth comparably low salary and wage payments requires a search as far back as the closing months of 1917.

This is all the bad news, at once.

August Certain To Better July; Hope for September

August is certain to show some improvement, if for no other reason than the fact most plants partially idle this month will have resumed. Dealers' stocks, now no more than normal, should be further reduced by retail sales, and where these stocks are replenished by shipments from factory stocks, an equally beneficial diminution of new cars will have been accomplished.

Detroit is not sure of it, but it hears many forecasts from the outside of a moderate upturn in general business conditions in the early fall, and so is hopeful that August improvement will carry over into September. Thus, while painting July as black as possible, Detroit is equally as hopeful of some betterment between Aug. 1 and Sept. 30.

◆

On account of vacations, daily production rates are meaningless. Individual conditions vary so greatly it can only be said that July at this point rates as a 250,000-275,000 car month, almost a third below June and about half of last July, when production was definitely on the slide.

Ford closed Friday night, July 11, not to turn a wheel except for plant rearrangement until Monday, July 28. Requisitions for steel are anticipating only ten days ahead, when work is resumed, and are based upon a daily rate of 7000. This was approximately the daily rate, with two shifts, when the plant went down Friday and compares with a peak of 9500 attained in May.

It is regarded as a harbinger of fair business, at least, that Ford will take in 2000 four-speed truck transmissions a day, from the Muncie Products Co., Muncie, Ind., beginning late this month. The two Ford blast furnaces and most of the ten open hearths are operating through the shutdown to accumulate stock.

It is again reported that Ford proposes to erect an open-hearth steel plant at Buffalo to melt scrap from his car-junking operation. The semi-finished steel would be shipped to Detroit.

Ford To Stamp Radiator Shells from Sheets

An important change in the Ford is a switch from sheets to cold-rolled strip as the basis for the so-called rustless radiator shells. Heretofore the shell has been stamped from a sheet, with headlights and other bright parts stamped from the scrap in the center.

Now strip steel, of the nickel-chrome classification, 5 13/16-inch wide and 0.025-inch thick, will be used. The result will be a slight change in the appearance of the shell at the top, but noteworthy economies in production. The Motor Products Corp., Detroit, is manufacturing a portion of the Ford requirements.

Other mechanical changes include a simplification of the four-wheel mechanical brakes and new design for part of the transmission.

Chevrolet Switching from Disk to Wire Wheels

Chevrolet, which is operating on the basis of 60,000 units in July, compared with 80,000 in June and 110,000 in May, is discarding disk wheels. As fast as the changeover can be accomplished, wire wheels will become standard.

Kelsey-Hayes Wheel Corp. will make about one-half of Chevrolet's requirements at the start. The other half has been distributed among various makers but will be recalled so soon as the Chevrolet gear and axle division in Detroit can be equipped to handle it.

Kelsey-Hayes, which is also manufacturing a large percentage of Ford wheels, recently purchased the Jaxon Steel Products Co., Jackson, Mich., from General Motors, which in turn gave back a five-year contract for all General Motors rims.

Dies for the new model Chevrolet already are being made, and it is reported that unless retail sales pick up the 1931 line will be brought out before the January shows.

Believe it or not, but there is one rumor that Chevrolet will attempt to eclipse Ford and all other adjacent competition with a frontwheel drive next year. There is authority for the observation that it would cost little, if any, more than the present conventional drive.

◆

Chrysler is announcing its new

eights, one of which is understood to be priced at about $1500 and the other, replacing the Imperial, at about $2500. The small Chrysler six, selling at $800, and the "70," also a six, round out the line for this year.

Because of the bulging radiator and long, vertical radiator lines, the new Chryslers, head on, are said greatly to resemble the Cord. In fact, to refer to the new models as "Baby Cords" is the quickest and surest way to lose caste with the Chrysler organization.

Incidentally, the Cord appears to be setting a fashion in design, much as LaSalle did several years ago.

The new Chryslers have no visors. The de luxe model have V-windshields. This year, it is said, there will be no frontwheel drive on Chryslers, but experimental work will continue.

For July, Chrysler has 8 working days scheduled. Apparently, sufficient of the new jobs to stock dealers have been made, and material requirements for July are disappointing. The DeSoto, Dodge and Plymouth divisions are not averaging over 2 days a week now, due to staggered vacations.

New Models Brighten Picture of Slack Production

Buick's new straight eights are scheduled to be announced probably next week. There are fewer changes in the bodies than in the chassis, due of course, to the shift from a six to an eight. The recent factory rate has been close to 1000 a day, but with dealers well stocked a reduction is probable.

The rumor persists that General Motors will not thrust a low-priced Buick straight eight into competition with the Oakland V eight, nor a higher-priced Buick straight eight against the Viking V eight.

Reo's first eight, expected in September, will be a large car, with a wheelbase of about 135 inches, and may supplement instead of displace the sixes. The new Packard standard will be little changed, it is said, except in the manifolding, to give greater acceleration. The competition of the Cadillac V sixteen may cause Lincoln to do something radical for 1931.

◆

Hudson-Essex, now completing its two-week shutdown, continues an enigma. Judging by its past performance when its models did not "take," it is due for a shift in models. It is generally expected in Detroit that changes will be made, but officials are quoted as saying they do not know how to make a better car for the money.

Studebaker's new gearshift, retaining sliding gears for low and reverse but helical gears for second and third speeds forward, is a development which Studebaker for several years has been perfecting and only at the last minute last year withdrew from introduction then.

Reo has been stressing its "silent second" for several years and has been making this type of transmission for Pierce-Arrow, which Studebaker now owns.

Cadillac-La Salle believes the best of material is wasted on an owner if not properly lubricated. Hence it is offering to provide lubricants and labor for 12,000 miles or 12 months, whichever is completed first, for $175 for the Cadillac sixteen, $130 for Cadillac eight and $110 for La-Salle eight.

Vacations Rule in July and Steel Tonnages Shrink

Ford, as previously noted, is entirely down July 11-28. Chevrolet is on a 3-day week in most divisions. Hudson-Essex is just completing its shutdown. Willys-Overland, which a month ago was at 600 a day, has scaled down to 2000 a month.

Graham, Oakland-Pontiac, Packard, and Timken Axle will be down July 18-Aug. 4. Motor Products is down July 11-28, General Motors truck at Pontiac is closing July 25-Aug. 4. Midland Steel Products is down July 12-28, and Auto Specialties July 3-20.

Practically all other automobile parts manufacturers also are closing for ten days to two weeks in July. Hupp Motor will be out of production the first two weeks of August.

In substantially every case these large consumers of steel are not taking in any materials during their shutdowns, depressing July to the lowest tonnage month since the end of 1929.

◆

In Detroit today can be sensed a numb feeling, quite similar to that which blanketed the district after the stock market collapse last fall but not quite so hopeless as then because it is believed the worst is now passing.

It is apparent that automobile production has been fully deflated, as have dealers' stocks, and that technically the industry has righted itself. Labor has been deflated, in a few cases by outright reductions in hourly rates but generally through a diminution of hours worked.

Surplus executives were hurriedly jettisoned last fall and early this year, but now the clerical staffs are being deflated. As noted several weeks ago, many companies are not working their staffs Saturday mornings, nor are they paying them for the half day. Chrysler has notified all salaried employes that hereafter salaries will be 90 per cent of the former rate which employes received.

Brokers in Detroit are reported to have closed out more accounts in the past two weeks than at the time of the big break in Wall Street last fall. Many do not believe motor stocks have yet touched bottom. The advice bandied about is to wait until stocks get within their 1927 range, then accumulate.

◆

In the face of the sharpest retail competition in years and the compulsion to bring costs down to a minimum, the automotive industry is maintaining quality. With few exceptions, the design of new models materializes the vision of the engineer and the stylist, with only occasional references to the purchasing department on the matter of cost.

The idea of economy has permeated through body design more than chassis layout. In at least one body plant an effort is being made to continue current parts into the new models to save replacing costly dies.

The quality of steel being specified differs little from a year ago. One manufacturer has studied his scrap situation, especially with regard to sheets, resulting in slight changes in sizes. By increasing the trim slightly, for example, sufficient metal remains for stamping out small parts.

◆

Nor is there any talk of mergers, despite the pressure of overhead. The gyrations of Dodge, first to New York bankers and then to Chrysler, with varying fortunes meanwhile, have had a salutary effect.

Out of every four automobiles sold this year, three have been the product of Ford or General Motors. One statistician estimates that seven makers, accounting each car as a separate make, will do 92 per cent of the industry's business this year.

United States Owns 80 Per Cent of World's Autos

As of Jan. 1 this year 35,127,398 passenger cars, trucks and busses were registered throughout the world, an increase of 3,092,826 vehicles or 9 per cent over the beginning of 1929, the department of commerce at Washington estimates.

The United States accounts for 26,653,450 of this total. In the United States one vehicle is registered for every 4.5 persons; in the rest of the world one for every 216 persons. In total registration, France, England and Canada follow the United States in the order named.

Although exports of well and refining machinery in 1929 established a record, those of the first five months of 1930 were 22 per cent larger than the corresponding period of the previous year.

EDITORIAL

Industry Needs More Flexible System of Wage Payment

STEEL'S price composite of iron and steel products is down 13 per cent from the average of 1926. The bureau of labor's wage composite for the iron and steel industry is up 5 per cent from the base year, 1926. With many plants idle part or all of the time and earnings of companies and their employes seriously impaired, the question may well be asked: Is there any merit in the sliding scale system of wage payment, applicable to the present situation?

Mutual dependence and co-operation in industry imply an equitable distribution of profits. In accordance with this doctrine profits and wages should rise and fall in unison. The characteristic feature of wage rates in the past six years has been their stability, independent of fluctuations in prices or profits. Capital and management have been "sold" on the new idea that to maintain wage rates is to provide buying power. Good, so long as operations, prices and profits were good; but not so good when they went into reverse. Industry slumped after the buying power of wage earners was maintained at a high level over a long period of years. Now that a depression has occurred despite high and stable wage rates, the rates must not be cut—according to this philosophy—for fear of further jeopardizing buying power.

Work has been apportioned to as many employes as possible by part-time operations, but this has not reduced unit costs. In 1929 the iron and steel price index was down 4.6 per cent from 1926, while the wage index was up 5.8 per cent. Prices continued downward until they now are 12.9 per cent below 1926. Wage rates, however, have moved along as though operations, prices and profits had not been affected.

Now Is Not the Time for Change

Is this right? Is it likely to lead to a favorable reaction sooner than otherwise and thus compensate in a measure for a dull period? In answer to the first question: No, it is not right or logical. It is as unreasonable as it would be to try to keep wages down while profits were high; it does not go all the way with that spirit of mutuality which is supposed to underly all industrial enterprise.

In answer to the second question: As industry has proceeded thus far with the doctrine it would be unwise unless the necessity was forced upon it to make a change at this time. It would not restore normal conditions; it would be a reactionary measure of sweeping and perhaps serious importance, and the general effect of it would be to destroy confidence.

Difficulties of this kind are not anticipated when business is riding on the crest of a wave. The lesson, however, has been learned, and the hope of the future is that the experience may be applied to meeting just such a situation. A plan which is inflexible, and does not give or take until it breaks entirely under economic pressure is absurd.

Sliding Scale Plan Is Being Studied

The sliding scale method of setting wage rates in accordance with price fluctuations is receiving more attention in some manufacturing industries. One of the first questions to arise is: Does this mean dealing with a trade union? The answer is: No, a company may establish a base rate and then determine its current rates from prices, independently of any outside influence, either by itself or in conjunction with a committee representing employes. In some instances where it has been tried it is reported to have worked so satisfactorily that employes who began as members of trade unions came to the conclusion that nothing could be gained by further payment of union dues.

The problem is not as difficult as that of establishing piece rates. The method is more easily understood than that of fixing such rates; it has a stronger appeal to the employe. The base rate may be varied at intervals of a year or longer; the scale may be governed to move downward less rapidly than prices. And most important of all, the reason for it justifies it in fair minds. The steel industry's experience with it in bar iron and sheet and tin plate mills, where it influences the wages of 30,000 or more, has not been unsatisfactory.

Unfortunately the present is not an opportune time to give the sliding scale plan a thorough trial, but when industry recovers the subject should be given careful consideration by executives concerned with the production of bulk commodities.

How Industry Is Greeting STEEL

Excerpts from a few of the hundreds of telegrams and letters received after the July 3 issue of STEEL had been distributed to subscribers

Congratulations from a Careful Reader

"I have had an opportunity of glancing over the contents of the first issue of STEEL which supersedes the *Iron Trade Review*.

"This number presents very interesting references to the progress of the steel industry, gives up to date information as to present business conditions surrounding that industry. The news articles are interestingly presented, the market reports are clear and concise, the advertising pages are neat and attractive and the construction news covers a wide area. On the whole the journal appears to portray a modern presentation of conditions surrounding the industry and we congratulate you upon a continuation of the policies and statistical reviews and probable trends which have manifested the issues of the *Iron Trade Review*. We wish you continued success in your work."

"A Forward Step in Progress"

"We consider your action in renaming the *Iron Trade Review*, as well as the stand which you are taking as the foremost exponent of broadcasting the future possibilities of STEEL, as a forward step in the progress of your publication."

Reader 38 Years; Likes New Arrangement

"I have very carefully examined the first issue of STEEL and wish to congratulate you upon its new dress and particularly upon the arrangement. I have read this paper for 38 years and its continual improvement should be a source of gratification."

Approves Change in Name

"I want to take this opportunity of congratulating you on the change in the name of your publication to STEEL. This is certainly more indicative of the activities which you have been covering for some years past than your previous name. Also I feel that this change is complimentary to the industry in which I am so largely and actively interested."

"Experience of Age and Vigor of Youth"

"I have looked over the initial number of STEEL very carefully, and can suggest no improvement in text, arrangement for the busy reader, or the variety and character of the news, which bear the impress of accuracy so essential for the confidence of the industry.

"You launch the publication of STEEL with the experience of age and the vigor of youth, a happy combination, and an augury of abundant success in your field of endeavor, for which I add my sincere wishes."

Lauds New Appearance and Progressiveness

"I wish to congratulate you on the new appearance of STEEL and the progressiveness of the Penton Publishing Co. which led it to change the name as it did."

Difficult To Improve Excellence

"You are to be congratulated upon the new vision and higher ideals typified in the new form and character of *Iron Trade Review*. The improvement is made more outstanding from the fact that *Iron Trade Review* already was an excellent magazine. For it is difficult to improve excellence.

"Our company of course is dedicated to the development of new uses for steel. Its engineers at all times are engaged in studying improvements in presenting fabricating methods and devising ways of fabricating new products.

"We are happy to welcome your magazine as co-partner in the advancement of STEEL."

Favorably Impressed

"In looking through STEEL, the writer was very much attracted to the new format used throughout. The new arrangement of heads gives a much more attractive appearance and creates the desire to read further into the story.

"Personally, the writer does not object to the placing of advertising pages amongst the editorial matter, and was, therefore, favorably impressed with your new arrangement, in which practically every advertising page faces reading matter."

"A Tribute to Progressiveness"

"Doubtless you have received numerous letters complimenting you and your staff on the excellent appearance of and the useful information in the booklet recently issued, entitled Steel—Basic to Industry."

"The changes in the name and nature of your magazine make most appropriate the publication

How Industry Is Greeting STEEL

(Concluded from Preceding Page)

of much statistical information in the way chosen by yourselves.

"Typographically the job is a tribute to the progressiveness of those who were responsible for the publication of the old *Iron Trade Review*. Its successor, STEEL, has a most attractive appearance, and satisfactorily meets the demands modern art has made on the printing industry. Candidly, I am not sure yet that I favor the admixture of advertising matter among the pages of reading matter, although I realize that this procedure is one being followed now by the great majority of publications. The plan probably is advantageous in most cases to the advertisers, but somewhat disadvantageous to the readers. Deciding the question from a broad standpoint probably is difficult, and I realize that a publication such as yours must give a great deal of consideration to the preferences of the advertisers, who must pay the freight in the last analysis."

Protests Against Ads in Editorial Section

"As a subscriber to your magazine STEEL, and a constant reader for many years, the signer (together with the other officers of our company) desires to protest against your new plan of inserting advertising pages in the reading matter.

"It seems a pity that a busy man need be bothered to turn over such advertising pages."

Gets Real Thrill

"I want to congratulate you and your associates on your launching of the new name for the *Iron Trade Review*. I got a real thrill out of your story and thought your plan of blind advertising leading to your final announcement was unusually successful."

Made a Wonderful Improvement

"Congratulations to all on the advanced step you have made in changing *Iron Trade Review*. You certainly made a wonderful improvement in the paper, and in changing the name you have done something that should have been done a long time ago."

Another Good Word for "Mirrors"

"We were very much pleased with the change you have made in *Iron Trade Review* and want to congratulate you on your new publication STEEL. We feel as you do that steel is the commodity to exploit and we believe that your journal as now lined up will be of more value to the steel and allied industries than the old *Iron Trade Review*.

"We are glad that you are giving Mirrors of Motordom a more prominent position because we feel that this is one of the best and most valuable reviews we read. We are also always interested in your graphs on the business trend because they are useful in laying out our production and sales schedules."

"A Compliment to the Industry"

"We compliment you on your foresight and aggressiveness in changing the name of the publication from *Iron Trade Review* to STEEL. You could have changed it to any one of many other names representing industries and articles in which your publication has taken an active part. Therefore, in choosing the name STEEL, you are paying the steel industry a singular compliment.

"We wish you the same measure of success with STEEL as the name of your publication in the future, as you have had with the name *Iron Trade Review* for a period of almost a half century."

More Interesting to the Busy Man

"I wish to compliment you on the improvement shown by the first issue of STEEL. I have taken the *Iron Trade Review* for years and believe you changed the present publication so as to make it much more interesting to the busy man. With best wishes for the success of STEEL."

"Accomplishes Your Objective"

"I have seen a copy of STEEL and personally do not hesitate to compliment you on the general improvement of the magazine. I think the set-up is a real improvement, by that I mean the captions and style of print and particularly the digest of the issue's contents as written up in its first pages. The general make-up will truly make more interesting reading and, I believe, accomplish your objective."

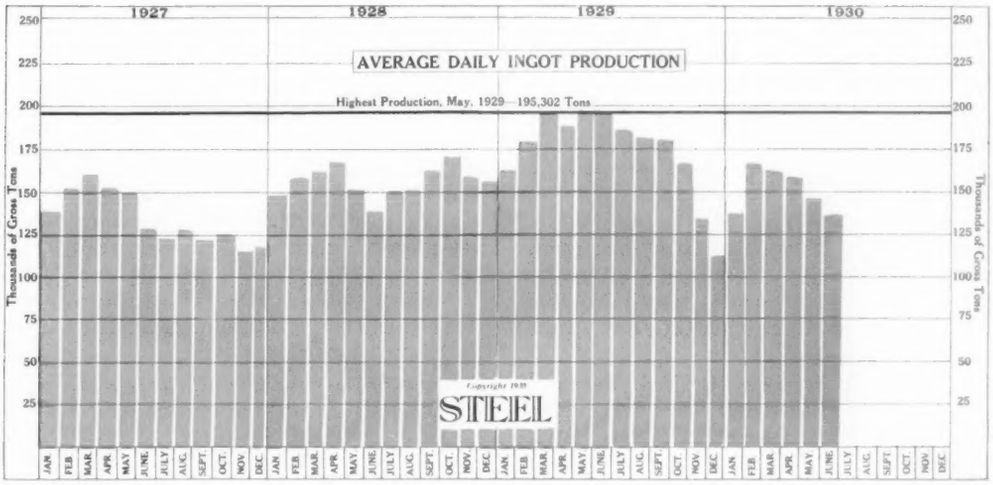
"More Valuable and Interesting"

"I have seen the first issue of STEEL and I wish to congratulate you and the Penton Publishing Co. on the many improvements made in the magazine. The entire make-up, including arrangement of advertising matter, typography, has been well thought out and I am sure it will make the book very much more valuable and interesting to its readers."

THE BUSINESS TREND

1929

Jan.	166,674
Feb.	180,366
Mar.	194,933
April	190,390
May	195,700
June	196,146



1930

Jan.	140,596
Feb.	169,930
Mar.	165,381
April	159,764
May	149,066
June	137,610

Downward Trend of Business Is Less Precipitous

JUDGING from the tendency of various factors which reflect the immediate condition of business, industry activity still is slowing down but the rate of decline is more moderate. This conclusion is based on indicators of orders, production and prices.

Machine tool orders were down in June. Unfilled bookings of the United States Steel Corp. were lower on June 30, but the decline from May was smaller than the drops in the three previous reports. Output of pig iron and steel in June was considerably below that of May. Freight car loadings were up slightly in the last week of June, but the total for the month was well below 1928 and 1929 figures. Quotations of steel and iron are lower, but the slope of decline is not as steep as it was several weeks ago.

Steel ingot production in June made a new low level for the year. For the fourth consecutive month output has been curtailed until the average daily production of steel ingots, as estimated by the American Iron and Steel institute, has reached 137,610 tons. The drop of 11,456 tons from the daily average of May represents a decrease of 7.7 for the month. June operations were at 68.73 per cent of capacity against 74.45 for May, 1930, and 100 per cent for June, 1929.

Predictions of Commentators Tinged With Rose and Deep Blue Hues

Commentators on business conditions have presented an interesting array of conjectures during the past few days. *The Business Week* came out flatfooted with a statement that the turning point has been passed and that business at this moment is on the upgrade. At the same time a congressman announced that industry must resign itself to a new price level "much lower than that which has prevailed during the past decade." Other opinions range all the way from unwarranted optimistic outlooks to futures tinged with the deepest shade of blue.

At no time in American industrial history has a decline of serious proportions continued for more than a comparatively brief period without at least partially compensating recoveries. Unless some new factor, that has escaped the attention of everyone, has entered the picture, the upturn from the present slump will appear as it has in the past, which means it cannot be far off.

Shippers Expect Third-Quarter Volume To Be 6.5 Per Cent Below 1929

One of the most interesting short-range studies of the business outlook is the quarterly report of shippers to the shippers' regional advisory boards to the effect that in the third quarter carload shipments of 29 principal commodities will be approximately 6.5 per cent below corresponding shipments last year. Just three months ago the shippers estimated carload freight would be 4.2 per cent under 1929 figures in the second quarter. Total freight car loadings in the second quarter actually were 11.3 per cent under 1929 levels, indicating that the estimate was unduly optimistic. The estimate of the shippers is always significant because it represents the collective opinion of a large number of observers, well distributed throughout the country.

Another comprehensive insight into business conditions is afforded by the sixth semi-annual survey conducted jointly by the National Con-

ference of Business Paper Editors and the Associated Business Papers, Inc. This report, to which editors of 150 industrial, technical, merchandising and service publications contributed, is rather cheerful in tone.

Business Paper Editors Believe Business Better Balanced

The editors believe the end of the period of depression is in sight. They look for improvement of business sometime between September and November. When this comes, business will respond readily since inventories of raw material are low and getting lower.

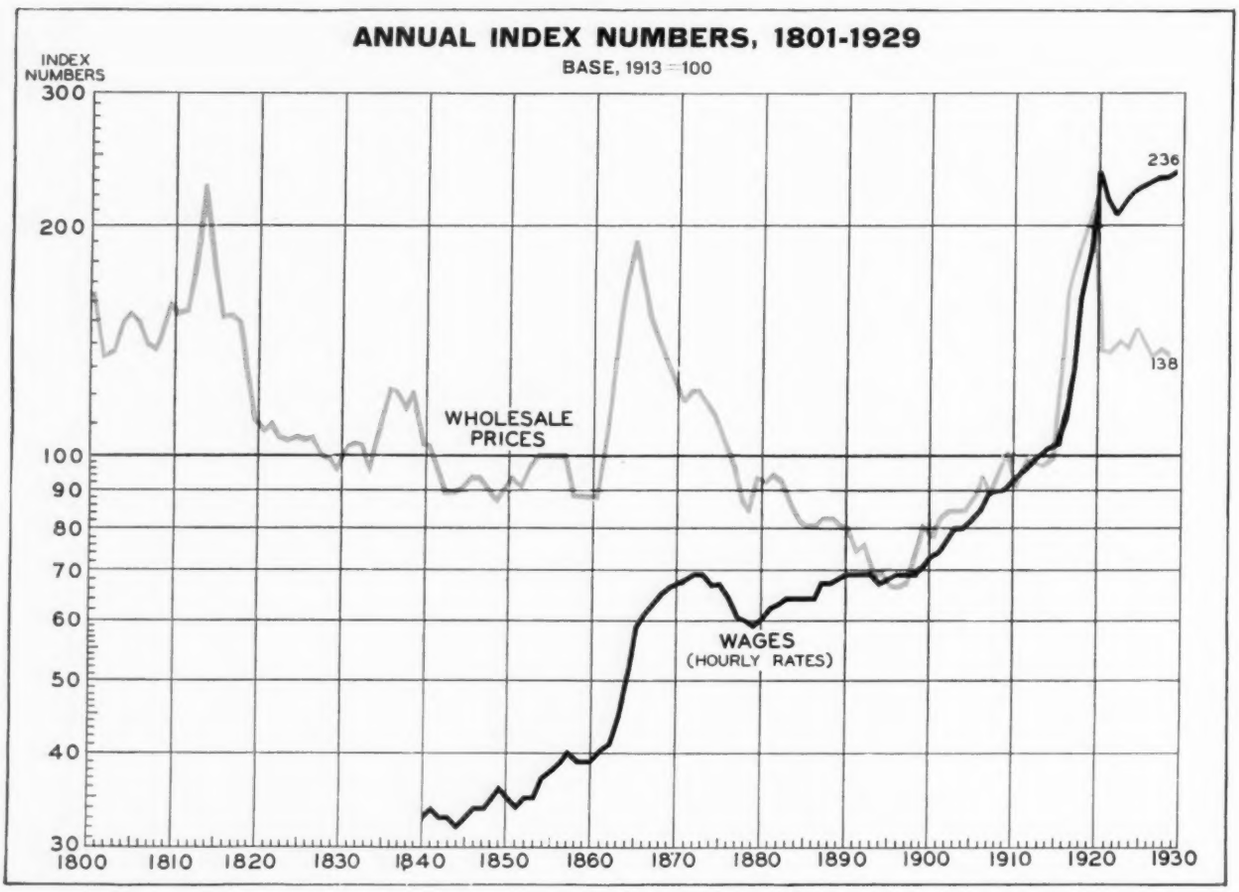
Continuing, the editors report that employment is off as much as 40 per cent in some lines, but that in certain industries it is above 1929 figures. Employment in shipbuilding is 20 per cent ahead of last year.

The generation of electric current, say the editors, is an excellent indicator of business because electricity is only produced as consumed. Two per cent more electrical energy was generated and consumed in the first five months of 1930 than in the corresponding period of last year.

The building situation is behind 1929 in private construction but ahead in public works. "Residential contracts are 47 per cent behind while contracts for non-residential construction are only 8 per cent behind and those for public works and utilities are 40 per cent ahead of a year ago, with the government program not fully in action."

"With the railroads, employment for the first four months of 1930 was 4.2 per cent below that of 1929. Passenger business was off 8 per cent and freight was off 9.7 per cent."

According to the report the situation in aviation is not particularly promising. Employment is off 60 per cent, as is production, and stocks of planes are "disturbingly large." On the other hand, motor bus transportation is expanding. Employment is up 5 per cent.



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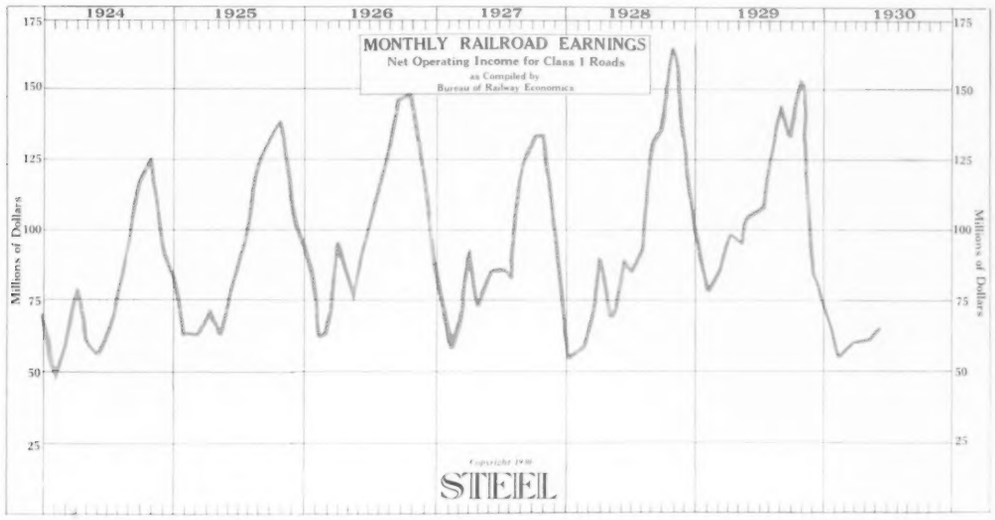
Prices and Wages, United States, 1801-1930

This chart, referred to on page 40 of last week's issue of STEEL and which has a bearing on the editorial on page 34 of this issue, shows the long-time downward swings of wholesale prices and the present divergent trend of prices and wages



May, 1930	$69,173,825
April, 1930	62,271,584
May, 1929	103,577,561
April, 1929	94,204,113

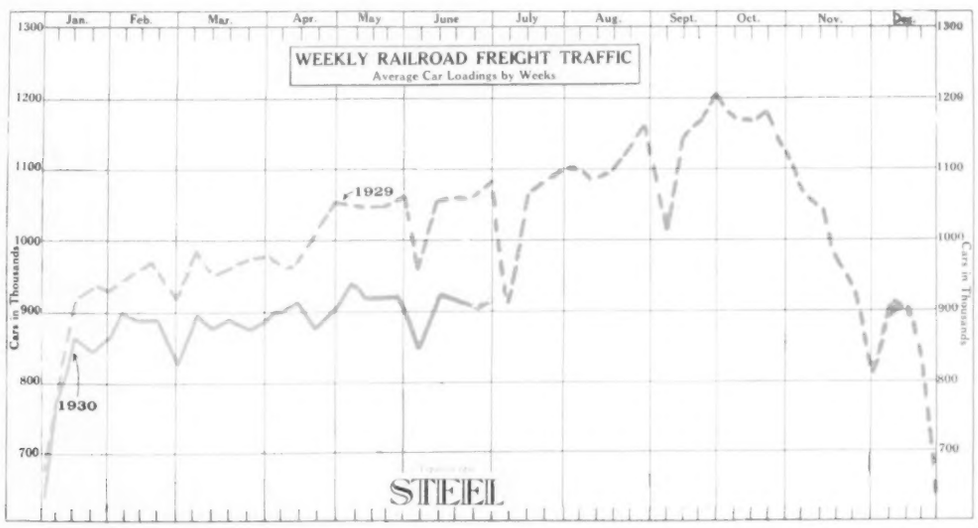
Earnings of Class I Railroads In May Show Slight Improvement

Earnings of 172 Class I railroads, as compiled by the bureau of railway economics, rose 10 per cent in May. Earnings for May are reported at $69,173,825 as against $62,271,584 for April. In spite of this rise, May earnings are 33.2 per cent below the $103,577,561 of May, 1929, and represent a return of 3.78 per cent on the property investment compared with 5.79 per cent a year ago.

For the first 5 months of 1930 net operating income amounted to $307,659,543 which was at the annual rate of 3.68 per cent on the roads' property investment compared to $457,017,242 or 5.58 per cent for the corresponding period in 1929.

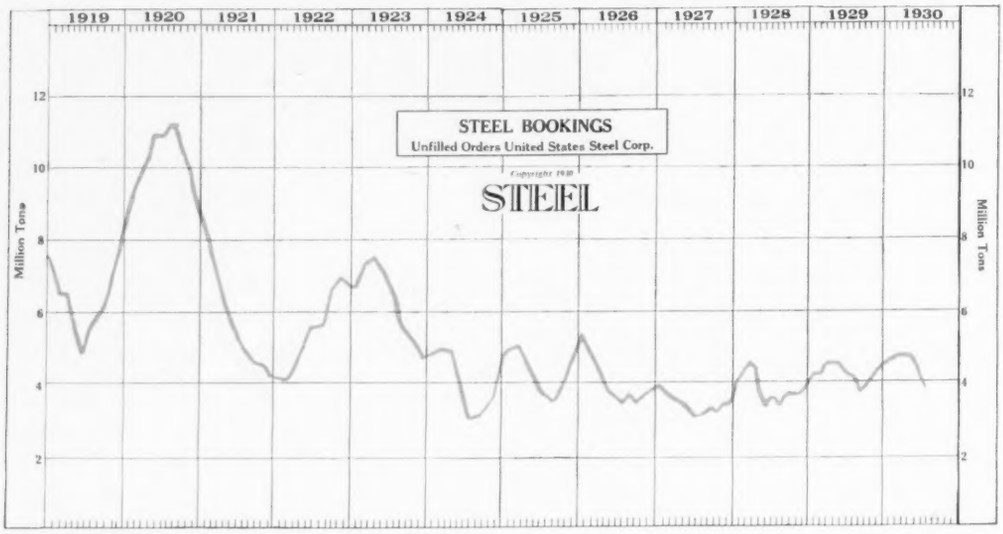
Freight Car Loadings Increase in Last Week of June

According to the report of the American Railway association, freight car loadings for the week ending June 28 were up almost 16,000 cars from the record of the previous week. While the total, 936,848, is the second best of the year, it is the lowest level for the corresponding week since 1925. The gain in the week ending June 28 over the seven-day period ending June 21 was about 1.7 per cent and is largely seasonal, since car loadings are usually tending upward in June. The figures for the last week of June are about 15 per cent under those of the corresponding week last year and 6.5 per cent below the comparable figures for 1928. Shippers expect third-quarter business to be 6.5 per cent below 1929.



1930	
June 28	936,848
June 21	920,859
June 14	927,754
June 7	935,647
May 31	860,249

1929	
June 28	1,096,569
June 21	1,069,874
June 14	1,071,245
June 7	1,055,768
May 31	972,825



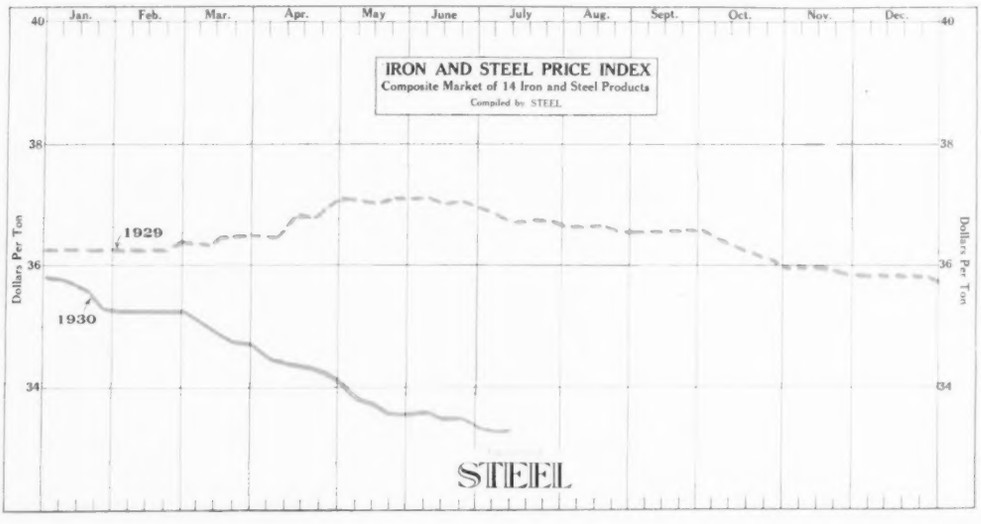
June 30, 1930	3,968,064
May 31, 1930	4,059,227
June 30, 1929	4,256,910
May 31, 1929	4,304,167

Unfilled Orders of U. S. Steel Decline But Drop Is More Moderate

For the fourth consecutive month unfilled orders of the United States Steel Corp. have declined. From the year's high of 4,570,653 tons reached in March orders have declined by steps to 3,968,064 tons in June, the lowest level of the current year. Although this is a decline of 2.25 per cent from the previous month, orders are 8.3 per cent above June of 1928 but, on the other hand, are 6.8 per cent below 1929. The decrease of 91,163 tons for the month compares favorably with the decrease of 294,993 tons for May and 216,433 tons for April. As inferred in last month's column large pipe and structural steel orders may have been an important factor in retarding the fall of orders.

Composite of Steel and Iron Prices Dips Slightly

STEEL'S composite of 14 steel and iron quotations dropped only 2 cents in the second week of July, due to the weakness of pig iron prices. While a United States congressman last week predicted that average prices for steel will go to a "new price level much lower than that which has prevailed during the past decade" and mentioned 1913 quotations as possible depths to which the market may sink, the current opinion among well informed authorities is that prices are dragging bottom now. The curve of STEEL'S composite is flattening out and the downward swing has continued as long as the average decline in past experience suggesting that the turning point may be near at hand.

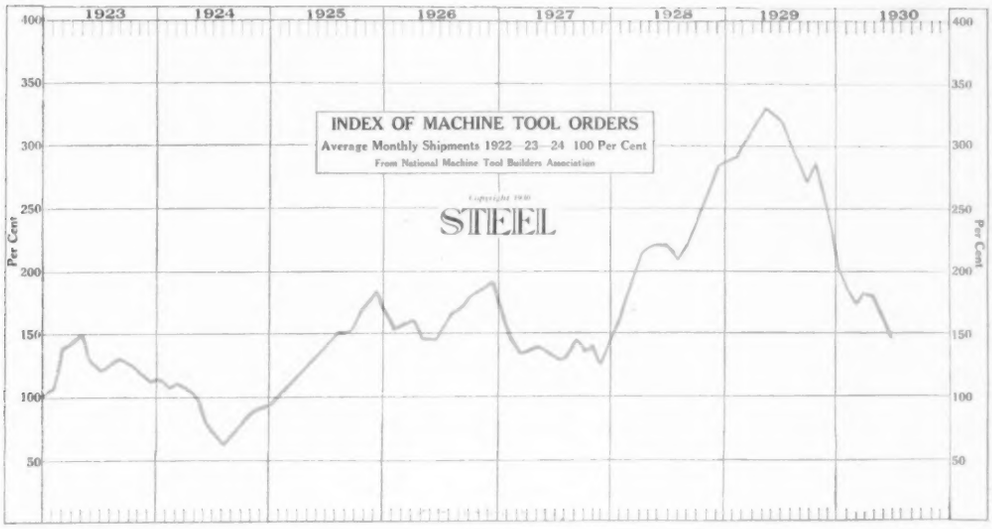


Weekly Figures

July 9	$33.32
July 2	33.34

Monthly Averages

June, 1930	$33.53
May, 1930	33.73
April, 1930	34.44
June, 1929	36.99



	1929	1930
Jan.	285.6	175.4
Feb.	300.8	172.6
Mar.	320.8	177.8
April	330.0	176.8
May	329.5	165.1
June	315.2	146.7

June Report on Machine Tool Orders Hints Turning Point Is Near

Machine tool orders, as indicated by the three months' moving average index of the National Machine Tool Builders' association, again dropped in June. However, encouragement is afforded by the fact that orders for class A and C companies (whose average shipments for 1922-24 were more than $50,000 and less than $10,000, respectively) showed actual increases. These gains were cancelled by the drop in class B ($10,000 to $50,000). The gains in A and C may forecast improvement in July, and seem to indicate that orders are near bottom.

Spread Between Steel and Basic Iron Prices Likely To Diminish

With the quotations of soft steel bars standing at 1.70c, Pittsburgh, or $34 per ton and basic foundry iron at valley furnace holding to its familiar level of $18.50, the curves of these two representative commodities are likely to converge again when the monthly averages for July become available. The bar price has remained at 1.70c during the first half of July and its position until the end of the month at that level is not certain. Weakness still prevails and the future still is uncertain. It is likely that market behavior of the next few weeks will have unusual significance.

Monthly Averages

	Steel Bars	Basic Iron
June, 1930	$35.00	$18.50
May, 1930	35.25	18.50
June, 1929	39.00	18.50

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Hardening Steel Commercially by Cyaniding Process

BY E. F. DAVIS
Metallurgist, Warner Gear Co.

SURFACE hardening of steel parts by means of cyanide, an age-old process, still is used widely to produce an intensely hard case on gears, worms, rings, etc. The accompanying article, the first of three, traces the development of cyaniding from the time of the alchemist to the present-day continuous cyaniding furnace. Part I describes the history of cyanide, properties and advantages of various grades, and the mechanism of the hardening process. Part II will discuss brittleness of cyanided work, cyaniding gears and wire, and some advantages and disadvantages of the treatment. Part III will deal with furnaces and pots for cyaniding, the aerocase method, fume prevention, cyanide poisoning and testing cyanide baths. Parts II and III will appear in early issues of STEEL. The author, E. F. Davis, is metallurgist, Warner Gear Co., Muncie, Ind.

Part I

CYANIDES for surface hardening are by no means new and their use as means of imparting intensive hardness to wrought iron has been known for at least 250 years. A product originally from the cauldron of the alchemist, cyanide no doubt was discovered in crystals formed from potions obtained by heating animal refuse with potash or wood ashes. The substance so obtained was a mixture of potassium carbonate and potassium cyanide. But due to the iron pots used in heating, ferrocyanide of potash was usually the ultimate product. Nearly all of the earlier treatises on chemistry mention hides, hoofs, blood, horn, manure and leather together with iron filings as the source of potassium ferrocyanide.

Previous to 1890 ferrocyanide was used almost exclusively for surface hardening. It was not performed in a molten bath as at present but the operation done by blacksmiths in a forge by heating up the steel, sprinkling on the ferrocyanide powder, reheating in the forge again and quenching in water. During the period when the bicycle industry was at its zenith po-

Photomicrographs showing case depths in steel specimens cyanided for varying periods at 1300 degrees Fahr. X100

tassium cyanide appeared on the market as a more effective and less expensive substitute for ferrocyanide powder.

Until 1914 potassium cyanide was the salt used for surface hardening. The war, which excluded the importation of potash salts from Germany, developed the domestic manufacture of sodium cyanide. The economy of this substitution was apparent immediately. Neither potassium nor sodium enter into the carburizing reaction but a compound of carbon and nitrogen known as cyanogen, $(CN)_2$ does. Potassium has an atomic weight of 39.1 and sodium of 23 or about one third lighter than potassium. One pound of potassium therefore would not contain as much cyanogen as 1 pound of sodium cyanide.

Sodium Salt Stronger

One hundred pounds of sodium cyanide contain approximately 53 pounds of cyanogen, whereas the same weight of potassium cyanide contains only about 39 pounds of cyanogen. Thus a 75 per cent sodium cyanide would equal a 98 per cent potassium cyanide. For that reason potassium cyanide, in spite of its lower melting point, has never reattained the pre-eminence it once held as a salt for heat treating.

The term "cyanide" as used in industry refers to a commercial quality of sodium cyanide designated in accordance to the percentage of sodium cyanide it contains. The four most common grades are:

Grade	Sodium cyanide, per cent
1	96-98
2	74-76
3	45
4	30

Grade 1 represents the highest quality used for heat treating purposes. The remaining grades may be regarded as adulterated cyanide being fused with sodium carbonate (soda ash) or sodium chloride (common salt) or both. Sometimes these diluted mixtures are sold under various trade names as "hardening salts." The cyanides also are sold as English, French, or American cyanide depending on their source. Cyanide is made by several processes, but the main difference is in the nature of the impurities incident to the manufacture.

Typical analyses of the different grades are as follows:

	GRADE			
	1, per cent	2, per cent	3, per cent	4, per cent
Sodium cyanate	0.5	.....	.....	.....
Sodium carbonate	2.5	2.5	37.0	30.0
Sodium chloride	0.0	22.5	18.0	40.0
Sodium cyanide	97.0	75.0	45.0	30.0

The above represents the approximate composition offered by one manufacturer of sodium cyanide but it is fairly average. In addition sodium sulphide, sodium bicarbonate, iron oxide and sodium cyanate usually are found in nearly all samples tested.

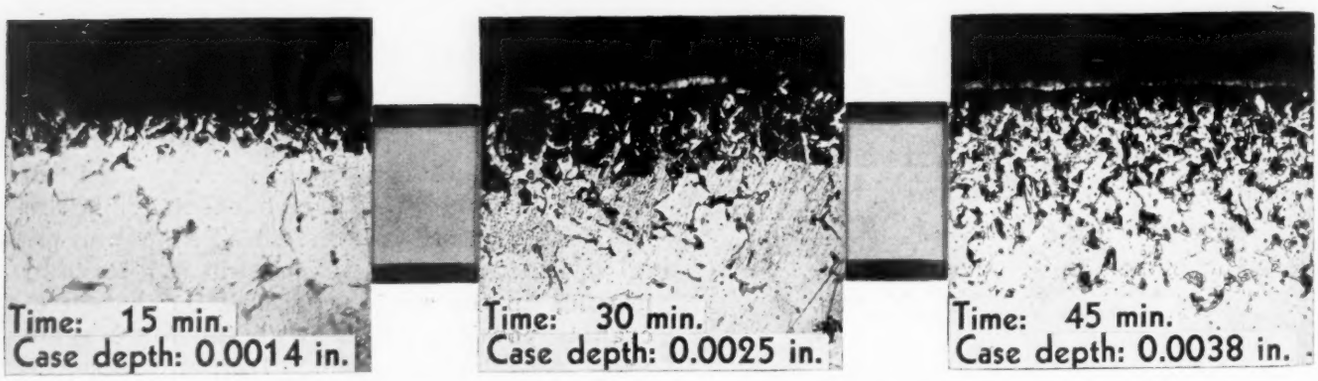
Mixing Not Economical

It is the practice of some consumers of cyanide to purchase grade 1 and add enough salt and soda to obtain the desired operating mixture. At first this may seem an economical procedure but careful cost analysis will not reveal enough saving to really pay for the mixing. The lower grade cyanides can be bought at a price scarcely covering the cost of the salt and soda used and danger

Effect of Temperature on Depth of Case

Size of Specimens

Immersion, minutes	Temperature, degrees Fahr.	Case depth inches
15	1,300	0.00025
15	1,400	0.00135
15	1,500	0.00175
15	1,600	0.00320
30	1,300	0.00050
30	1,400	0.00250
30	1,500	0.00400
30	1,600	0.00480
45	1,300	0.00100
45	1,400	0.00375
45	1,500	0.00500
45	1,600	0.00600



Photomicrographs showing case depths in steel specimens cyanided for varying periods at 1400 degrees Fahr. X100

Photomicrographs showing case depths in steel specimens cyanided for varying periods at 1500 degrees Fahr. X100

always exists of mistakes in proportioning the different ingredients when it is done by workmen in the user's plant. On the other hand, manufacturers of cyanide have the proper equipment and technical supervision to fuse the salt in definite and uniform proportions. An exception to this would be those makers who mask the cyanides under different names and attempt to foist them upon the market at exorbitant prices. It is usually most economical to buy cyanides directly from manufacturers and not from brokers and other intermediate sources.

Advantages of Various Grades

The cyanide content of an operating bath never should be below 15 per cent sodium cyanide. In the writer's plant cyanide content is held between 20 and 30 per cent sodium cyanide. Cyanides decompose rapidly and the decomposition rate is highest in the more concentrated or pure grades. Grade 3 cyanide does not lose its cyanogen strength as rapidly as grade 1, the reason for which is explained later in this article.

Since the above is true, many believe it more economical to use grade 3 rather than grade 1. However, in production hardening the cyanogen content will reduce itself more rapidly than the cyanide bulk is reduced by the "drag out" and if more 45 per cent cyanide is added to raise the sodium cyanide percentage too much bulk is accumulated. If 96 to 98 per cent cyanide is used a smaller amount would be necessary to raise the cyanide percentage. Under these conditions grade 3 cyanide would be economical only in the original melt. The operation of raising the cyanide content without undue increase in bulk is termed sweetening.

In most plants where cyanide hardening is done in quantity there always is an accumulation of ladled out cyanide to supply enough low grade cyanide for melting up.

Another advantage of grade 1 cyanide is its lower melting point, this being 560 degrees Cent. Grade 2 cyanide melts at 570 degrees Cent. and grade 3 cyanide at 625 degrees Cent. Therefore the purer grades of cyanide will be more fluid and will not congeal as rapidly when parts are removed from the bath and consequently less will adhere to the work. The addition of grade 1 cyanide to a sluggish bath will increase its fluidity.

The lower grades of cyanide are most useful where the "drag out" is excessive or, in other words, when considerable cyanide is removed from the bath when the work is withdrawn. This is especially true when parts are hardened in baskets or other forms of mass heating with fixtures, or when the material has surface oxide due to preheating before immersion in the cyanide, such as in the cyanide dip method now popular in gear hardening.

Low Grade Salt Has Use

Grade 4 cyanides are best adopted for a heat treating medium where cyanide is used merely as a source of heating and the carburizing properties are not essential. This is applicable for the medium carbon alloy and carbon steels. This grade is not reliable for carburizing operations because of the low sodium cyanide content.

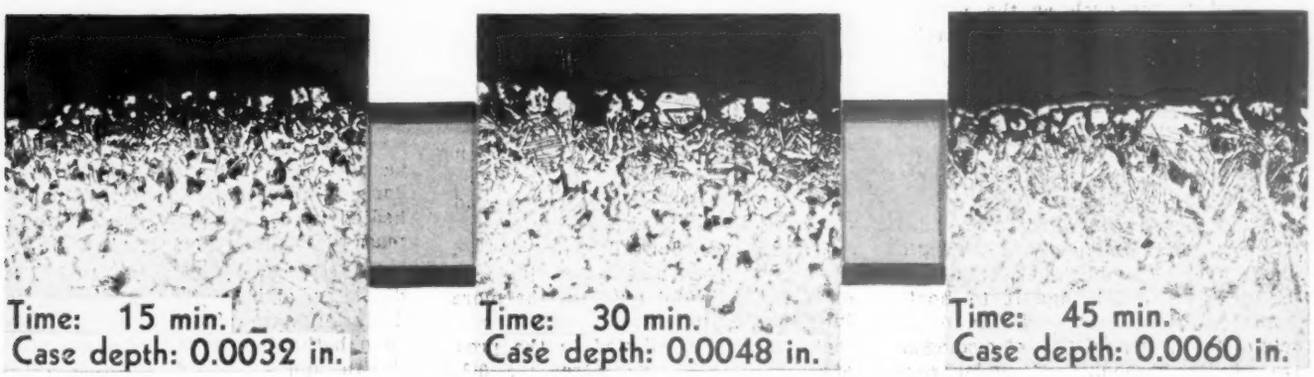
The grades containing chlorides have a tendency toward rusting the work, stacks, hoods and everything of steel or iron with which they come into contact. The rusting of work develops from the salt brine formed by the dissolving of the cyanide chlorides in quenching.

Like most nitrogen compounds,

Effect of Mass on Depth of Cyanided Case

Cyaniding Temperature, 1500 Degrees Fahr.

Size of specimen, inches diameter	Time of immersion 15 minutes Case depth, inches	30 minutes
0.25	0.0045	0.0058
0.50	0.0035	0.0042
0.75	0.0030	0.0040
1.00	0.0027	0.0040
2.00	0.0025	0.0040
3.00	0.0023	0.0040



Photomicrographs showing case depths in steel specimens cyanided for varying periods at 1600 degrees Fahr. X100

cyanide is not a stable salt when exposed to air or moisture but is always in a state of progressive decomposition. The products of decomposition are first, sodium oxide; then sodium hydroxide; and by absorption of carbon dioxide, the final product is sodium carbonate. The cyanogen radical is gaseous in the free state and in breaking up aids in forming a number of intermediate products such as ammonia, cyanates, formic acid, free carbonate, etc. But the ultimate solid decomposition product is sodium carbonate.

Decomposition Is Rapid

As an indication of the rapid decomposition of cyanide a test made in the writer's laboratory by brushing a concentrated solution of 96 to 98 per cent cyanide on the surface of a glass plate and allowing it to dry showed the following results:

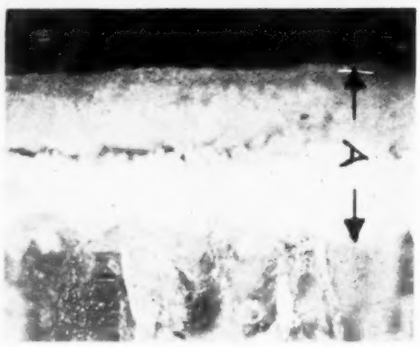
Exposure, hours	Sodium, cyanide, per cent
24	40.2
48	10.4
96	1.2

Note—Sodium cyanide crystallized from the aqueous solution would contain two molecules of water and of course affect this percentage, but the decomposition rate is illustrated.

Cyanide fused in slabs, eggs or in other mass forms does not decompose as rapidly as it does in the pulverized or granular state. All forms are fairly stable if kept from air and moisture. Deterioration begins on the surface; hence the rate of decomposition increases with the enlargement of the surface exposed. The exterior of a slab of cyanide may show a low cyanide content whereas the interior is little affected. Improper sampling of cyanide for analysis has often been a source of argument between vendors and consumers of cyanide. Delaying the performance of a chemical determination after a sample has been powdered or using the dust in cyanide containers as representative samples are examples where incorrect check analyses would be made.

Molten cyanide does not decompose unless in contact with substances with which it has a chemical reaction. Unfortunately these are nearly always present in a bath. With some substances such as the nitrite and nitrate salts used extensively for tempering, cyanides combine with explosive violence. Most of the reactions are exothermic and generate heat within the bath. Cyanide pots which fail to come to heat may have their temperatures raised rapidly by the addition of coarse mill scale, iron ore or other form of iron oxide. The thermal reaction within the bath itself supplies additional B.t.u. to the cyanide and brings it to heat.

As has been mentioned, the products of the decomposition of cyanogen are mostly gaseous; yet under certain conditions the carbon remains as a residue and floats to the surface as a black scum. This usually is because of the presence of easily reduced oxides in the bath. The black scum can be formed artificially by the addition of iron scale to the molten mass. New cyanide pots often contain iron oxide on the inside surface of the basin. This is why a black scum sometimes develops when a new pot is first placed in service. This black scum, although frequently regarded objectionable, is often a marked benefit in retaining the heat and reducing radiation losses. Being carbonaceous and porous it is a poor heat conductor and serves as a cover or blanket. When large rectangular pots are employed in production hardening this covering is valuable in improving thermal efficiency, reducing fuel consumption and adding to the comfort of the furnace operators. In addition, furnaces so covered do not lose their cyanogen content as rapidly as those which are clean.



Decomposition of 96-98 per cent cyanide or cyanegg, as it is called. The decomposed layer, represented by *A*, measures 0.010-inch, and is the result of 63 days exposure in air

Cyanide Hardening

The cyanided case is distinguished by different properties than those obtained by pack hardening or by gas carburizing processes. The latter produce carbon concentrations on the outer layers as high as 1.25 per cent and averaging about 1.00 per cent. The cyanided case, however, averages between 0.50 per cent and 0.70 per cent carbon. The case formed by standard carburizing practices and modern carburizing cements is characterized by an absence of nitrides unless the carburizer is itself nitrogenous, such as leather and bone. The cyanided case, on the other hand, yields on analysis 0.60 to 0.80 per cent nitrogen and sometimes as high as 1.00 per cent.

We are therefore dealing with a case as rich in nitrides as it is in carbides. Without question the more intensive hardness of cyanided surfaces may be attributed to the presence of these nitrides because a 0.60 per cent carbon case would not become file hard quenched from 1400 degrees Fahr. in water or 1500 degrees Fahr. in oil. Furthermore, a cyanided case is much harder than a carburized one. A case wholly nitrided and containing no carbides beyond the original carbon content of the steel attains hardnesses equivalent to 1200 brinell, being so hard it will dull the hardest file and a brinell ball will flatten when a test is applied.

Cyanide will produce carbides and nitrides at all temperatures above the melting point of the cyanide. The illustrations of various cyanided samples show a definite case obtained at 1300 degrees Fahr.

Factors Control Penetration

The depth of cyanide penetration is governed by mass, time, temperature and percentage of cyanide in the bath. The cyanogen content does not appear to be a marked factor providing sufficient is present to react with the steel. If a molten bath contains little or no cyanogen no carburizing or nitriding activity could occur, but if sufficient is present not much difference in penetration would be noted whether the cyanide contained 98 per cent or 15 per cent sodium cyanide. The case depths of 1-inch test bars immersed for 30 minutes at 1500 degrees Fahr. in cyanides of different concentrations is as follows:

Sodium cyanide content, per cent	Case depth, inches
94.3	0.0060
76.0	0.0070
50.8	0.0060
43.0	0.0060
30.2	0.0060
20.8	0.0055
15.1	0.0050
10.8	0.0040
5.2	0.0020

Below 15 per cent a decrease in cyanide activity is quite apparent yet all samples were file hard and those hardened in 5 to 20 per cent cyanide were actually harder to the file than those hardened in 30 to 94 per cent cyanide baths.

When cold steel is placed in molten cyanide the adjacent area cools and congeals on the surface. The cyanide bath immediately begins to transfer its heat to the steel but this is retarded to some extent by the congealed mass surrounding the steel which is slower in heat conduction than the molten salt. Gradually the steel reaches a temperature at which the adhering cyanide becomes molten again. The time required for this depends upon the mass of metal to be heated for it is obvious that a larger mass would require a longer time.

Thus if a piece of steel ¼-inch in diameter and another 3 inches in diameter were placed simultaneously in a bath of cyanide and each withdrawn and quenched in 10 minutes

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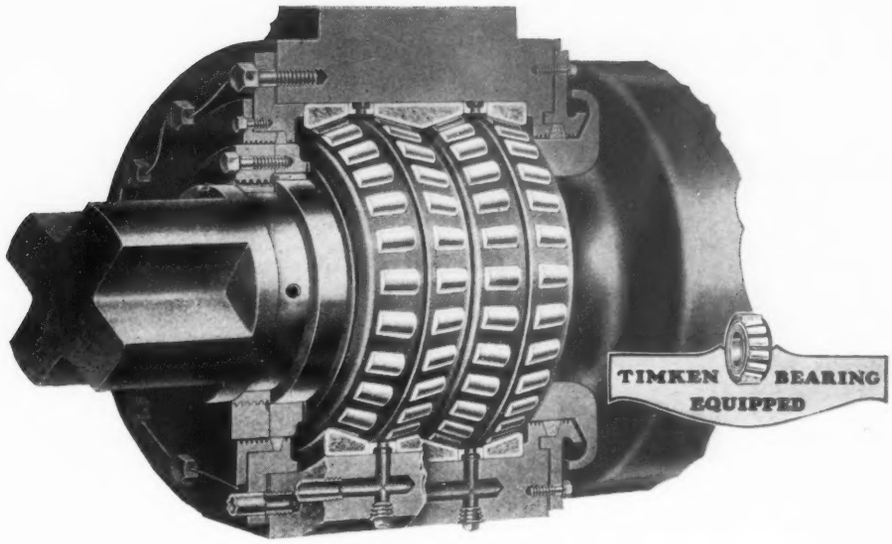

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And when proved power savings of from 40 to 50% are added to this supreme endurance, it would seem to be sound policy to consider discarding obsolescent rolling mill equipment and obtaining immediately the production and profit-protecting advantages of Timken tapered construction, Timken positively aligned rolls and Timken-made steel.

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Building Contractors Favor Steel Equipment

USE of steel in equipment formerly made entirely of wood is meeting with growing favor in building construction. Sidewalk bridges, material towers and scaffolding are providing a growing market for steel, and, as indicated by the increased use of the steel type, are doing a better job than the old wooden structures.

Steel sidewalk bridges have a number of factors to recommend their use. Among these are improved appearance, parity in cost, greater strength and better illumination. The improved appearance of the steel bridge has done much to lessen the aversion of the public to walking near scenes of construction, a circumstance that formerly had a serious effect upon business in surrounding neighborhoods. Large contractors stock parts necessary for construction of these bridges, thereby facilitating prompt erection. An overhead protection of the steel type, as shown in the accompanying illustration, recently was built in Pittsburgh by the American Tubular Elevator Co. over an alley adjacent to the new addition to the Bell Telephone Co. building in that city. Erection of this bridge was started on Saturday noon and traffic was resumed the following morning.

The American Tubular Elevator Co., Pittsburgh, introduced the tubular tower for the handling of materials in building construction in 1922 and since that time has built some 40 miles of towers. The equipment is either sold or leased and, because of the complete salvage of parts after a job is completed, has found its best market in large cities where contractors have constant use for such towers. Speed and simplicity of erection, strength and safety, elimination of fire hazard and the fact that it can be used many times over, account for the popularity of the steel tower over the wooden type which often is a total loss when dismantled. About 70 per cent of the towers currently in use are built of steel, while in active building centers such as New York, Chicago and Philadelphia, the percentage now is nearly 90.

Parts Are Interchangeable

These towers consist of a bottom section, the necessary number of intermediate tubular sections each 6 feet 6 inches in height, and a top section containing the cathead with sheaves. All intermediate sections of a given type of tower are identical and the top and bottom sections can be attached to any one of them. The intermediate sections are made up of legs, consisting of steel pipe 2 to 3 inches in diameter, girts and braces to prevent vibration and distortion, and tubular guides. The joint between the legs is formed with an external sleeve, with two bolts at each joint for attaching the necessary horizontal girts and diagonal braces. As all parts are interchangeable, intermediate section parts of a single tower can be used to make up a tower of two or more compartments. Base castings are made of malleable iron and these castings are fastened to I-beams forming the base.

Height of the building being constructed offers no limitation to the use of these towers. Both the Chrysler building and the Bank of Manhattan building in New York employed steel towers, the former being served by six double towers varying in height from 390 to 762 feet, while the latter used eight towers with one to four compartments per tower and with heights from 351 to 762 feet. Towers also are adaptable to use on a set-back type of building. On a number of jobs of this kind the lower part of the tower is erected inside the building, coming outside at the first or second set-back.

The standard parts of steel equipment also lend themselves well to use for both interior and exterior scaffolding work. In addition to its fire-

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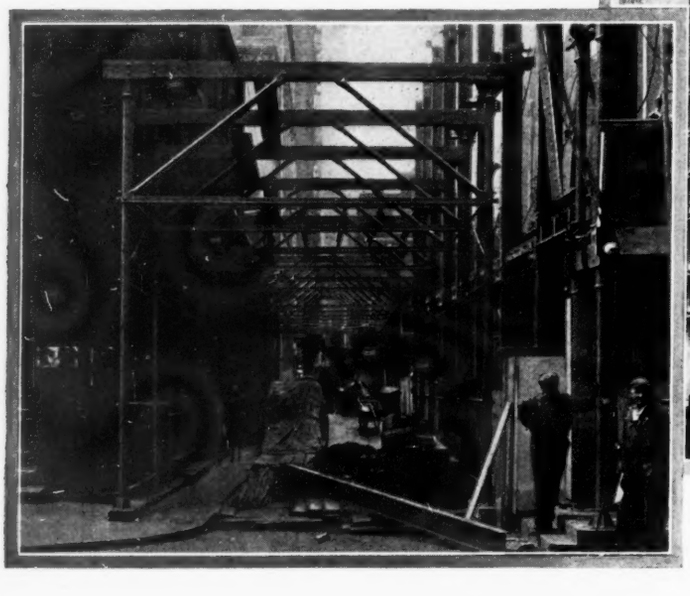
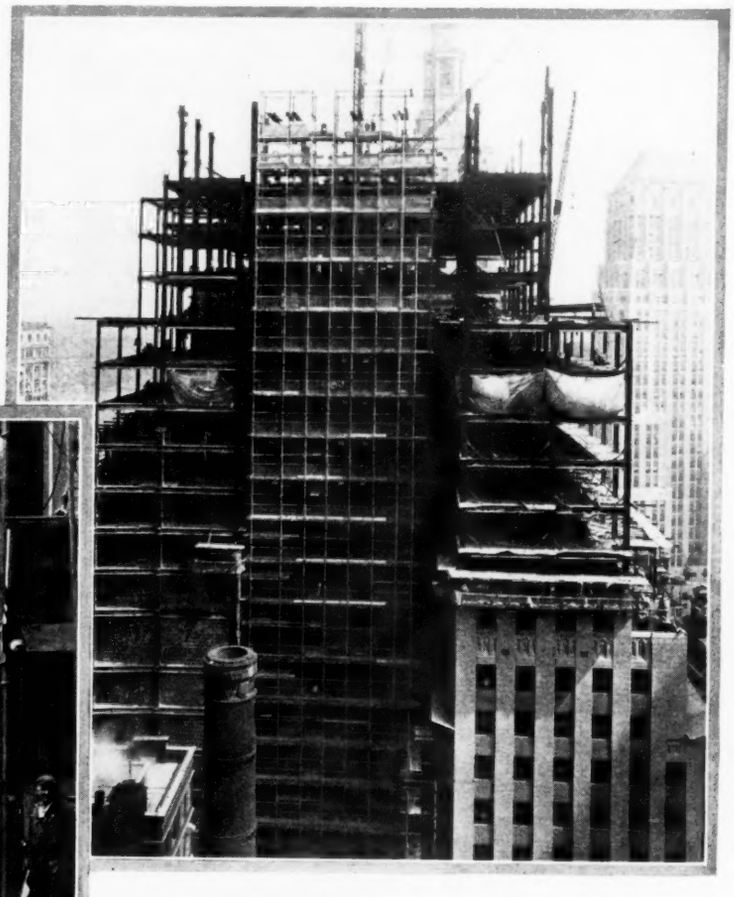
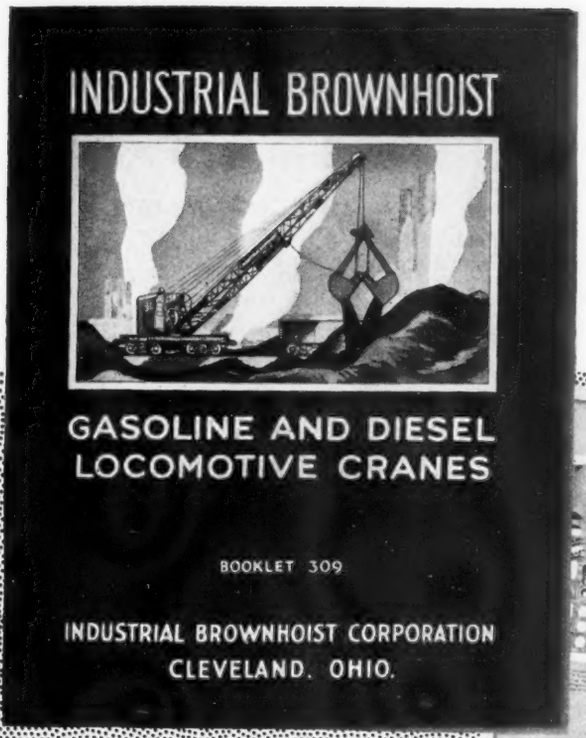




(Above)—Steel tubing used as scaffolding on the Bank of Manhattan building. (Left)—Steel framework designed to safeguard traffic adjacent to building operations



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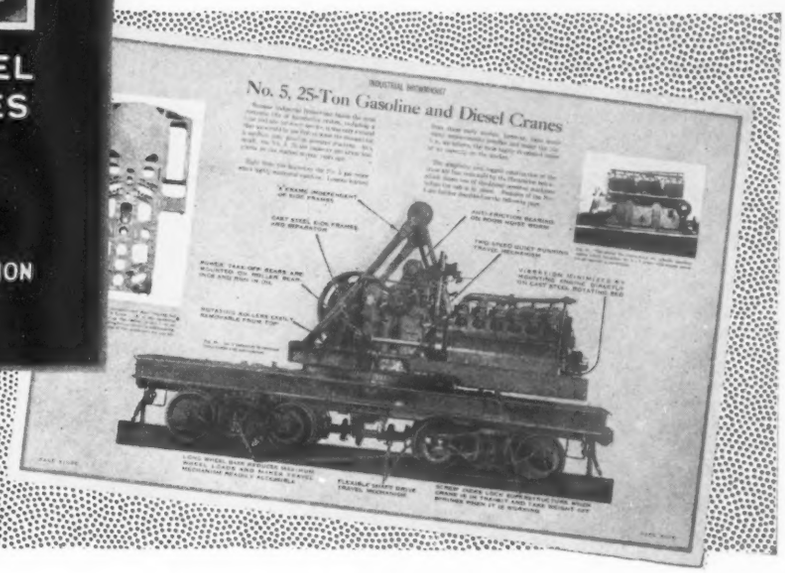

A New Gas and Diesel Crane Catalog

During the past decade, Industrial Brownhoist has been a pioneer in the development of gasoline and Diesel powered locomotive cranes. Successful right from the beginning, these cranes have created a widespread interest among users of material handling machinery. As a result of these years of experience, greatly simplified and perfected models are now available in sizes ranging from 10 to 40 tons capacity.

A new catalog, Booklet 309, has been prepared which describes these different sizes of Industrial Brownhoist Gasoline and Diesel Cranes and shows them handling many kinds of materials with bucket, hook and magnet.

We will be glad to send a copy of this catalog to anyone interested in modern material handling methods.

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INDUSTRIAL BROWNHOIST

Steel Deck Replaces Wood on Tank Car Runways

TANK car runways, long made of wood, now are being brought up to date by the use of steel in their fabrication. The steel runways, applied in sections, three to a side of the tank car, are approximately 50 per cent more expensive than the wooden type, but are calculated to pay for themselves in reduced upkeep and increased factor of safety, according to an article in the July 2 issue of *National Petroleum News*, Cleveland. Skelly Oil Co., Tulsa, Okla., has adopted the new construction and is gradually fitting all its tank cars with the steel decking.

F. W. McGrath, tank car shop superintendent, Skelly Oil Co., is shown holding two types of steel decking which the company is using to replace wood on tank car runways. Steel, although more expensive than wood, requires less maintenance.

The first car to be equipped with the steel decking was fitted out in March, 1928. Steel grating, manufactured by the Irving Iron Works, Long Island City, N. Y., was used, as shown at the right in the accompanying illustration. Outside bars were of ⅛-inch stock, ¾-inch wide. Inside network members were ⅛-inch by ½-inch, and the supporting cross members ½-inch by 1 inch. An additional outside frame member was ¼-inch by 2½ inches. Runways consisted of three sections, riveted to the supporting arms on the car. Due to different designs in cars, the decking had to be "tailor made" to fit each separate car.

A second type of steel decking recently has been used quite extensively. It is an electrically welded material, shown at the left in the illustration, and is manufactured by Blaw-Knox Co., Pittsburgh. Longitudinal members measure 3/16-inch by 1¾ inches; cross members are electric welded into the longitudinal strips. With this type of decking it is possible to cut and fit the runways at the car shop.

Design Permits Riveting

One of the principal advantages of the steel runways, according to F. W. McGrath, tank car shop foreman of the Skelly company, who is shown holding the two types of grating used, is that they may be riveted to the supporting arms of the tank car. Bolts with which wooden runways formerly were applied constituted a serious hazard and caused a large part of the upkeep expense of the wooden decking. Due to the difficulty of obtaining lumber of sufficient length the wooden runways had to be spliced and bolted together. In service the lumber often shrank and the bolts were pulled out of position and stripped from the nuts. This condition, of course, is obviated with the use of steel grating and rivets.

Steel decking costs in the neighborhood of $95 to install on a car, against $60 for the wooden type. Average life of the wooden decking is about three years, during which time continuous repairs must be made. The steel installation is expected to last practically indefinitely.

Building Contractors Favor Steel Equipment

(*Concluded from Page* 48)

proof construction and great strength and rigidity, steel scaffolding minimizes obstruction to light and affords more working space and greater accessibility to all portions of the building during its course of construction. In addition to the economies incident to its use, the reduced hazard to workmen in erection, use and dismantling has been an important factor in the favor which the steel scaffolding has found with contractors.

Guest, Keen & Baldwins Ltd., British steelmasters, have established a new record for pig iron production in the British Isles by a tonnage of 4000 tons in a single week from its No. 4 furnace at the Dowlais works at Cardiff, Wales. Another furnace at the same works has a weekly capacity of 3700 tons.

Steel Chairs Are Designed for Easy Storing

A new steel chair, so constructed that it may be nested with others of the same type, was a novelty displayed at the recent furniture show in New York by the inventor, Louis Dellert, Brooklyn, N. Y. The new chair, which is of rigid construction without any moving parts, is intended to serve wherever chairs are required, and particularly in auditoriums, meeting rooms, hotels, and similar places where a minimum amount of space for their storage when not in use is desirable. These chairs are all duplicates of each other, are of steel construction throughout and may be upholstered in any style desired.

Welded steel chairs can be nested

The principle of construction which permits an indefinite number of these chairs to be nested, one into the other, is that the seat frame is open in the back and converges toward the front. The rear legs, unlike the usual construction, are mounted outside of the rungs, thus helping to create the opening for the nesting. The frame of these chairs is constructed of 20-gage black sheets; the legs and back are welded tubing made of 20-gage sheets; and the rungs also are formed of sheets. The inventor believes the new design paves the way for steel to surplant wood in large measure in chair construction.

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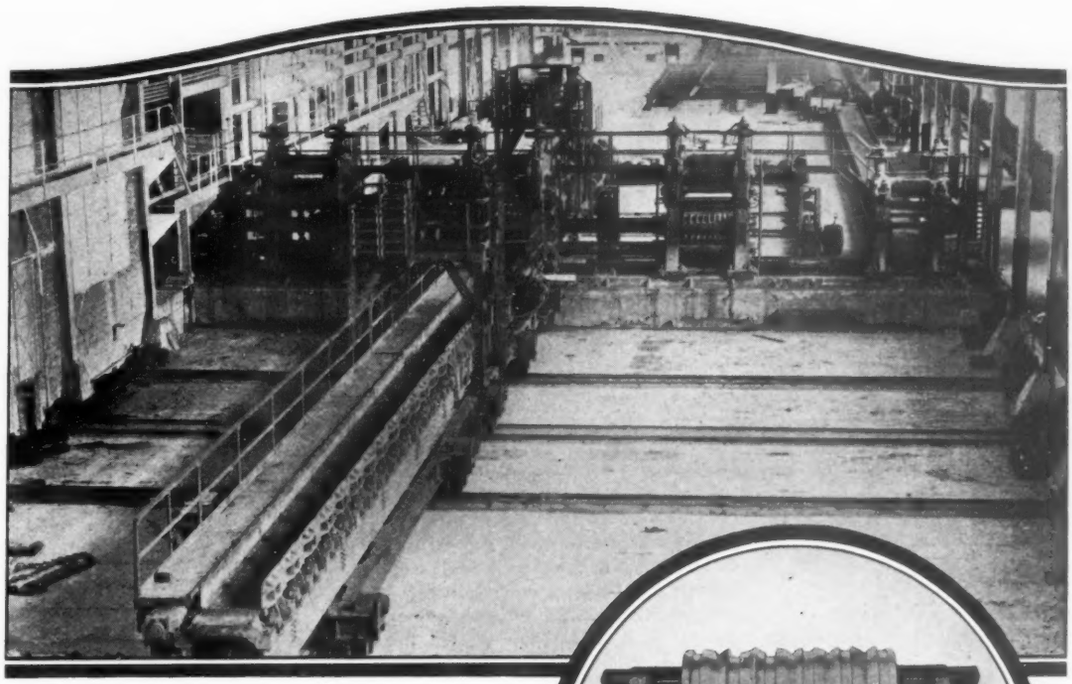

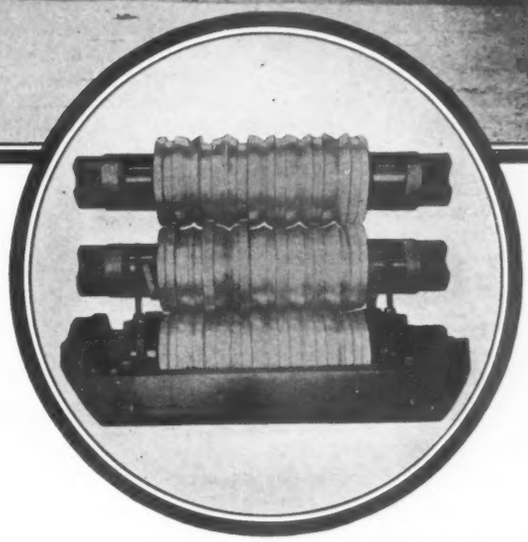

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The above illustration shows a 26″ Structural Mill and Tables recently installed for rolling Aluminum Alloy Structural Shapes for the United States Aluminum Company at Massena N. Y. This plant has been painted with their aluminum-bronze powder paint.

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Using Corrosion-Resistant Steels in Aircraft

BY JEROME STRAUSS
Chief Research Engineer, Vanadium Corp. of America

DURING the few years of their commercial life, corrosion-resisting steels have found entry to practically every phase of industrial activity. Marine construction and chemical and oil industries have been major users, but even though in a small way insofar as tonnage is concerned, their value in solving the problem of permanence in other fields has been no less marked. Aircraft construction is no exception. It is true, of course, that there has been no real standardization of any of these steels for specific aircraft parts and that the use of many of them in the structural parts and engine parts of flying craft is in the experimental stage.

Compositions Are Changing

But this is more or less true of all their applications; compositions are changing, the steelmaking and shaping methods are changing, heat-treatment procedures are changing, fabricating practices are changing; the entire metallurgical and mechanical development is in a state of flux, and the user is endeavoring through study in a practical way to determine the best solution of his problems. Hence it seems best to present at this time only a brief statement of the properties of those compositions that possess promise.

Of primary importance to the aircraft designer is the weight of the elements of his structure. As a result he desires, and frequently does employ, materials under conditions involving a low safety factor and with it must demand of them as near perfection as can be obtained, for the hazard is great and loss through material failures must be carefully guarded against. The significance of steel quality and of adequate inspection to assure reliability are therefore apparent. Too much emphasis cannot be placed upon these two features. The closest possible approach to perfection is required in avoiding or eliminating surface and internal discontinuities and in maintaining uniformity of grain size and grain characteristics to permit uniform response to heat treatment. There is also the necessity for fabricating operations that are closely controlled within limits which are not detrimental to the particular composition involved, carefully supervised heat treatment and finishing operations, and close inspection at all stages of production by those competent to accept or discard. Only by such thorough practices can reliability be assured and the hazard diminished. This assumes that design features have been carefully studied.

It is natural that in engine design the experience of the automobile industry should have been drawn upon. And it is no surprise that for valve construction one of the lower-chromium steels with high silicon has found much favor. This steel has the nominal composition carbon, 0.40 per cent; chromium, 8.5 per cent; and silicon, 3.5 per cent and responds readily to forging and to heat treatment. Through quenching and tempering, a range of properties may be secured about as follows:

Proportional limit, lb. per sq. in.	75,000 to 125,000
Tensile strength, lb. per sq. in.	125,000 to 210,000
Elongation in 2 in., per cent	25 to 2
Reduction of area, per cent	55 to 4

The treatment of valves usually consists of quenching in oil from 1900 degrees Fahr. followed by tempering at 1400 degrees Fahr. and subsequently requenching the tip from the same temperature and tempering at 400 degrees Fahr. Valves in this condition serve very well and scale only slightly even when operating temperatures approach 1400 to 1500 degrees Fahr., but they are not especially strong at this temperature and flow and gall slightly on the stem.

The higher chromium steels also offer possibilities for the designer of aircraft. So-called "stainless iron" having a nominal composition of carbon 0.10 per cent and chromium 12.5 per cent, may have its properties appreciably varied by heat treatment. Quenching in oil from about 1750 degress Fahr., followed by tempering, produces the following range of tension and impact test values:

Proportional limit, lb. per sq. in.	30,000 to 125,000
Tensile strength, lb. per sq. in.	80,000 to 190,000
Elongation in 2 in., per cent	35 to 13
Reduction of area, per cent	75 to 40
Modulus of elasticity., lb., per sq. in.	30,000,000
Izod impact value, ft.-lb.	115 to 30

Corrosion Film Will Form

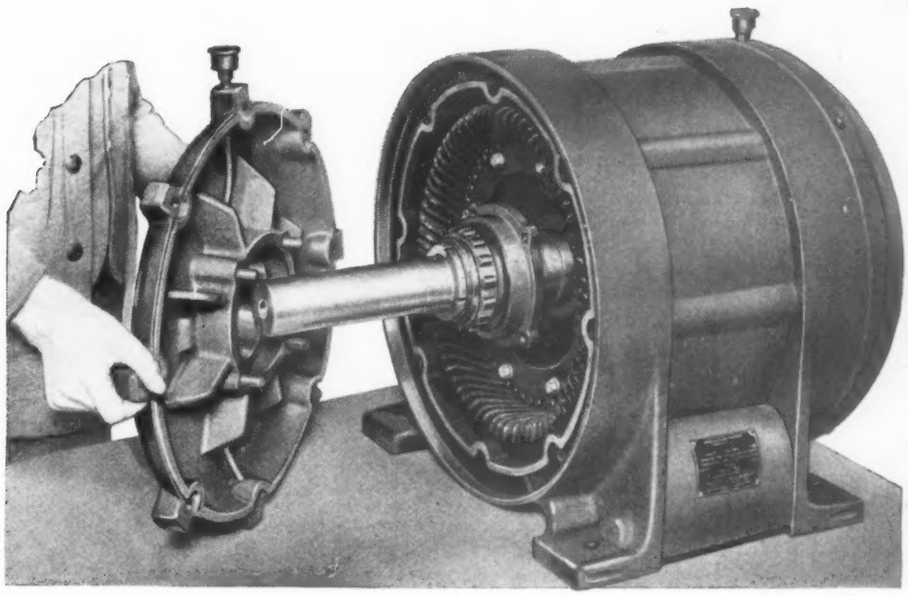
This steel in moist atmosphere will acquire a film of corrosion product in time, but rusting then practically ceases, assuming the metal to be of high quality. It will remain scale free in air up to about 1200 degrees Fahr. and still possess moderate strength at this temperature. Forging is readily carried on, using practically the same practice as for carbon and low-alloy steels. Air cooling from the forging heat, however, results in hardening up to the maximum shown in the above range of tensile properties. Machining may be carried on satisfactorily at speeds slightly less than those employed for simple steels of equal tensile strength.

Corrosion resistance is influenced only slightly by heat treatment, but is somewhat higher after quenching and tempering than in the annealed condition. Maintenance of the alloy at elevated temperatures does not result in grain growth and consequent brittleness unless the chromium content is somewhat above 13 per cent and high temperatures are maintained for rather long periods. The metal may be brazed or soldered and may also be welded but the welds are hard and lacking in toughness unless the welded assembly is subjected to heat treatment that is suitable to the material.

Hardening may also be effected by cold working, producing in small wires, for instance, tensile strengths up to 200,000 to 250,000 pounds per

CORROSION-RESISTING steels are finding utilization for structural and engine parts in aircraft. No real standardization has taken place, because development still is in the experimental stage. For that reason, the accompanying article, a paper presented at the aircraft symposium during the recent annual meeting of the American Society for Testing Materials, is timely; it discusses the most promising steel compositions and their applications. The author, Jerome Strauss, is chief research engineer, Vanadium Corp. of America, Bridgeville, Pa.

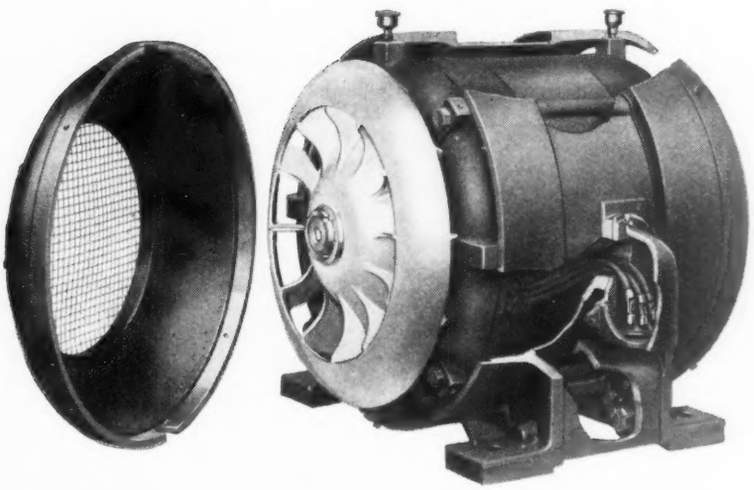
Completely Enclosed without Sacrificing Accessibility



type ARZ fan-cooled motors

Protection to the motor windings with complete accessibility to all parts . . . that was the thought in mind when the Allis-Chalmers type "ARZ" motor was developed. The active parts of this motor are completely enclosed, protecting the stator windings and the rotor — those parts that are subject to injury — from dirt, dust, metallic chips, sulphurous gases, acids, etc.

End closures and bearing supports, including lubricating devices, are combined into single castings with machined fits and make this motor as accessible as the conventional open type. There are no rubbing or revolving seals and no separately attached coil enclosing devices. Cooling air is furnished by a single fan keyed and locked on a short shaft extension opposite the drive end. The mounting space of this enclosed motor is the same as the open type in most ratings.



Leaflet 2109 tells about these and other standard Allis-Chalmers features. . . *Write for a copy.*

ALLIS-CHALMERS

Allis-Chalmers Manufacturing Company, Milwaukee

square inch, and in this condition the alloy may be used for springs and like applications; the resistance to corrosion is not noticeably impaired by this uniform distortion. These various properties suggest a number of applications among which may be noted propeller hubs, exposed engine parts, springs, stream line wires, etc. The steel is available in many forms, including hot-rolled and cold-drawn bars, forgings, wire strip, wire rope, sheets, seamless tubing, etc.

Stock for Machining Sought

In the interest of producing a "stainless iron" that would lend itself to smoother and faster machining and thereby permit the manufacture of screw machine products of corrosion-resistant steel, a number of modifications of this composition have been developed. In these the carbon content is approximately the same, the chromium content about 1 per cent greater and uniformly distributed throughout the metal in very fine dispersion is a suitable nonmetallic body that breaks the continuity of chips removed by cutting tools in quite the same manner as in screw stock, thus imparting "free-turning" properties.

The composition is so chosen that corrosion resistance is approximately the same as for "stainless iron" but the temperature required for effective quenching is raised about 75 degrees Fahr. and the maximum strength obtainable by heat treatment is only about 135,000 pounds per square inch. In other respects the properties are quite similar and the same commercial forms may be produced. Where rapid or automatic machining is desired or finer finish by machining, grinding or polishing is demanded, and the mechanical properties are ample, material of this class is indicated.

The higher-carbon medium-chromium steel known as "stainless steel" also has a few possible aircraft applications. Its composition is normally about carbon, 0.30 per cent, chromium, 13.5 per cent. It is capable of greater hardening than the lower-carbon steel and after oil quenching from about 1850 degrees Fahr. will show on tempering the following range of properties:

Tensile strength, lb. per sq. in.	90,000 to 260,000
Proportional limit, lb. per sq. in.	50,000 to 140,000
Elongation in 2 in., per cent	25 to 2
Reduction of area, per cent	60 to 3
Modulus of elasticity, lb. per sq. in.	30,000,000
Izod impact value, ft.-lb.	65 to 5

It possesses a much greater variation in resistance to corrosion with change in thermal treatment, being best in the hardest condition, but even in this state is somewhat inferior to "stainless iron." It is this hardest form in which it is likely to be of interest for aircraft use, chiefly for ball or roller bearings or other bearing surfaces. In forging, the alloy behaves much like high-speed steel and in machining operations is comparable to the low-alloy steels of somewhat higher tensile strength.

Two other chromium steels of slightly different composition, but somewhat similar properties and applicable to the same class of service may be noted:

Carbon 0.60, chromium 16.5 per cent.
Carbon 1.10, chromium 17.0, silicon 1.0 per cent

Both compositions develop approximately the same degree of corrosion resistance as the "stainless steel" but both also may be heat treated to higher hardness values and greater compressive strength. These steels remain scale free up to about 1400 degrees Fahr. and at this temperature still possess moderate strength.

Mention must be made of one other medium-chromium steel, much used for valve construction. Its composition is carbon 1.30 per cent, chromium 12 per cent, cobalt 3.5 per cent, molybdenum 0.75 per cent. The thermal treatment employed is frequently a heating to 1650 degrees Fahr. followed by relatively slow cooling to 1300 degrees Fahr. and then cooling in air. This steel at the maximum temperatures used in motor operation scales slightly from the attack of exhaust gases, but possesses excellent strength and consequently does not show distortion or galling of the stem.

Variety of Uses Satisfied

Other plain chromium corrosion-resisting steels of much merit are regularly manufactured for a variety of commercial uses but in aircraft production could have no more than limited and unimportant applications need therefore not be considerd.

The quaternary chromium steels containing nickel as a principal component, however, are of great industrial importance and value and offer many possibilities in the design of flying craft. A number of types are in use, but it appears necessary to give detailed consideration to only a few of these. The nominal compositions are:

Carbon 0.12, chromium 18.0, nickel 8.0 per cent
Carbon 0.06, chromium 18.0, nickel 8.0 per cent
Carbon 0.15, chromium 18.0, nickel 8.0, silicon 1.0, tungsten 4.0 per cent
Carbon 0.25, chromium 18.0, nickel 25.0, silicon 2.5 per cent
Carbon 0.20, chromium 26.0, nickel 21.0, silicon 2.5 per cent

All of these steels are austenitic, technically nonmagnetic and do not harden by quenching but only by cold deformation.

The first of the group is the one most commonly used and of the greatest importance. It possesses extremely high resistance to corroison and in moist atmosphere if a well-made product suitably finished, may be expected to remain rust free for an indefinite period. In its softest condition, secured by rapid cooling from 1950 to 2150 degrees Fahr. it shows the following approximate range of tensile properties depending upon the exact composition, heat treatment, form and cross section:

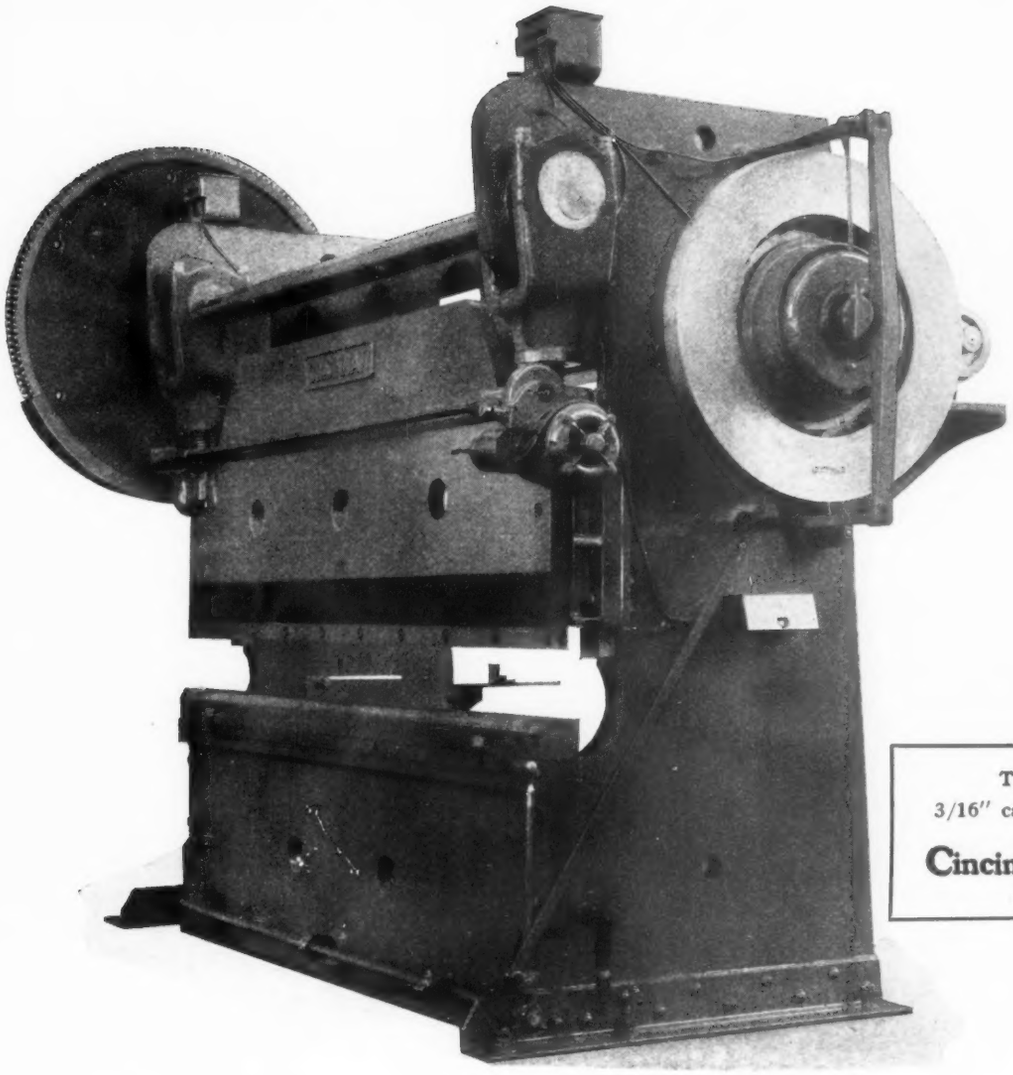
Tensile strength, lb. per sq. in.	80,000 to 100,000
Yield point, lb. per sq. in.	30,000 to 55,000
Elongation, in 2 in., per cent	65 to 50
Reduction of area per cent	75 to 50
Modulus of elasticity, lb. per sq. in.	27,500,000
Izod impact value, ft.-lb.	100 to 120

Proportional Limit May Be Low

In this condition the proportional limit, carefully determined, may be found to be below 10,000 pounds per square inch. In the hot-rolled condition the mechanical properties are notably higher, especially the proportional limit, and on cold working they increase still further. In fact, this alloy, more ductile than any carbon or low-alloy steel and capable of much greater deformation without rupture in forming and drawing, likewise hardens more rapidly with cold work than any of the simple steels. When deformed the tensile strength rises rapidly but the proportional limit and yield point are increased even more rapidly. In thin sheets, tensile strengths as high as 200,000 pounds per square inch may be obtained and in small wires up to 230,000 pounds per square inch; it is interesting to note that this "hard" sheet is still very ductile and may be successfully carried through some forming operations.

Machining of this steel may be accomplished, but with some difficulty and only at speeds much below those used for the plain chromium corrosion-resisting steels. Unfortunately as the strength properties are decreased by working, machining becomes rapidly more difficult, in particular such operations as milling and drilling. While corrosion resistance is ample in any state for aircraft uses, it reaches a maximum after the softening quench noted above. It is also worthy of note that it offers great resistance to the combined effects of stress and corrosion. Furthermore it retains much of its ductility at low temperatures, in fact, down to the boiling point of

(*Concluded on Page* 60)



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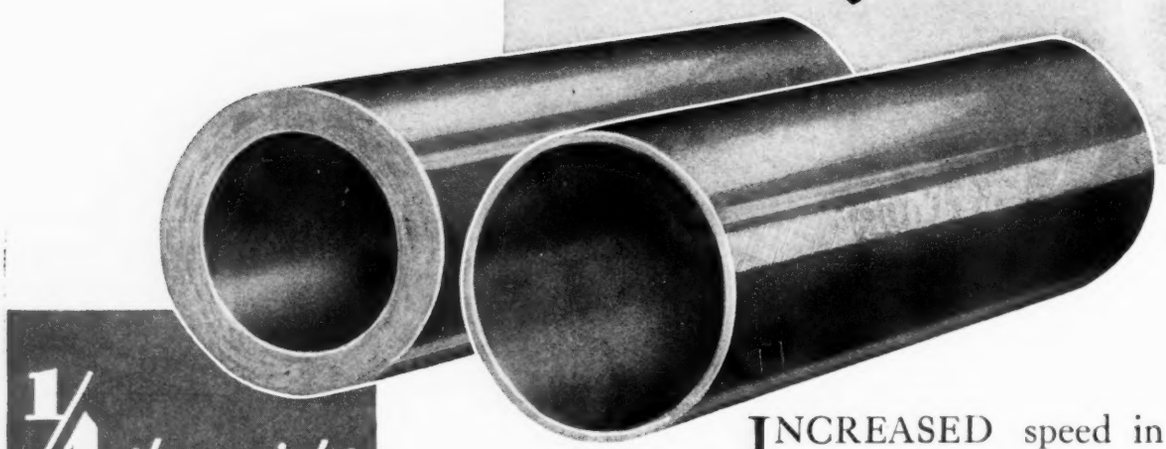

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ALLOY STEEL MECHANICAL TUBING

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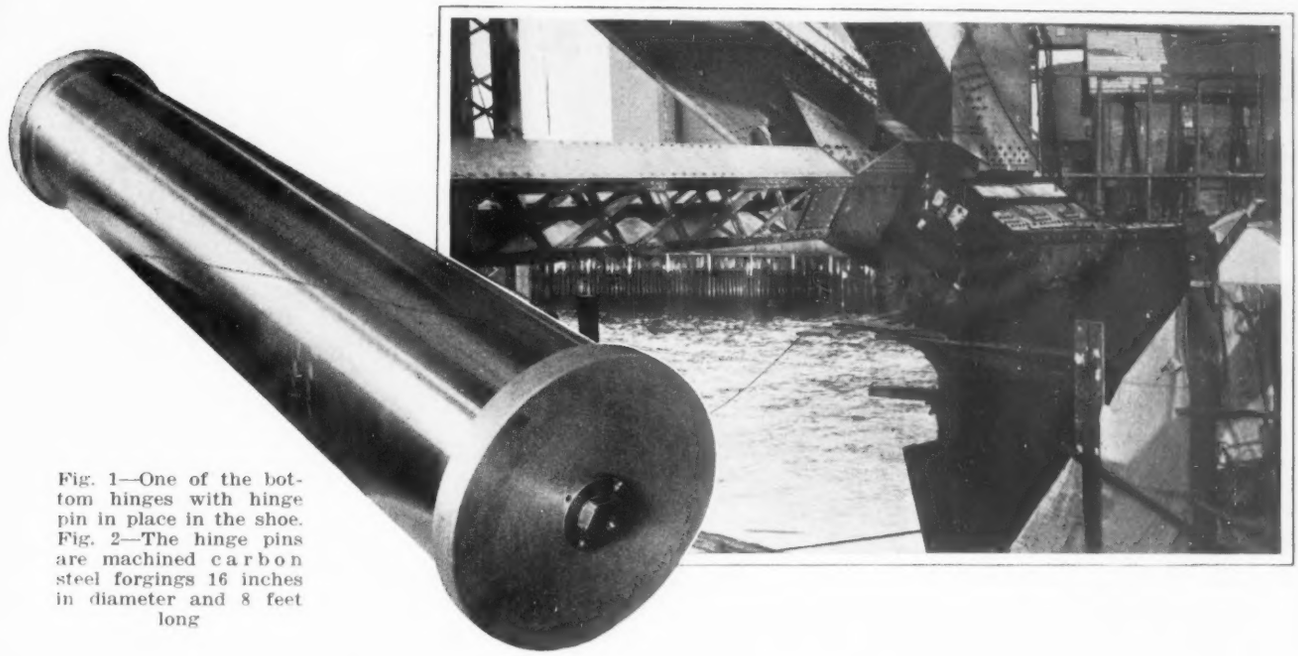


Fig. 1—One of the bottom hinges with hinge pin in place in the shoe. Fig. 2—The hinge pins are machined carbon steel forgings 16 inches in diameter and 8 feet long

Manganese Steel Is Employed in Kill van Kull Bridge

**TO REDUCE the weight of long arch span bridges, designers have cautiously but surely turned to alloy steels. The Hell Gate span connecting Long Island with the mainland was fabricated with its lower cord of nickel steel and engineers of the Port of New York Authority specified nickel steel or its equivalent for the lower cord of the Kill van Kull bridge which will be the largest arch span in the world. When the American Bridge Co., New York, secured the contract for this bridge, it started exhaustive research and development work to determine a suitable material for the lower cord and finally submitted a plan to the Port Authority calling for the use of manganese steel in rolled plates and shapes fabricated with manganese steel rivets. Subsequent tests were favorable and the material was tentatively accepted by the supervising engineers. Four or five sections then were built up and tested at the bureau of standards, Washington. The result exceeded all requirements and the material was accepted. This is the first extensive use in this country of manganese steel for the structural members of a bridge. The steel as submitted had the following chemical analysis and physical properties: Carbon, 0.40 per cent maximum; manganese, 1.80; phosphorus, 0.04; sulphur, 0.05; silicon, 0.10-0.30; ultimate strength, 90,000 pounds per square inch; yield point, 55,000 pounds per square inch; elongation, 16 per cent; and reduction of area, 30 per cent.

Cost Per Pound Lower

This steel was furnished at 0.75 cent per pound below the price stipulated for nickel steel. Manganese rivets were also offered and accepted for fabricating the lower cord. These rivets are slightly softer than the manganese steel in the rolled shapes, but tests indicated an ultimate strength of approximately 82,000 pounds and a yield point of about 47,000 pounds per square inch. The permissible shear allowed by the supervising engineer in the design of riveted joints was 22,500 pounds per square inch for the manganese rivets and 15,000 pounds per square inch for the carbon rivets. Tests of both single and double-riveted shear connections gave a strength for the manganese steel rivets more than 60 per cent higher than that of carbon steel rivets.

The design of the lower cord is indicated in Fig. 1. The section is essentially that of a square double box with a sectional area up to 984 square inches.

After making the tests of manganese steel, the Port of New York Authority issued supplementary specifications to cover this material. These stated that the steel was to be made by the open-hearth process and that a sufficient discard was to be made from each ingot to secure freedom from piping and undue segregation. The minimum tensile strength of the structural steel was stated as 90,000 pounds and of the rivet steel as 82,000 pounds. Other features of the specifications were similar to those covering nickel steel except for variations of a minor character.

Three different steels have been specified for different parts of the bridge, silicon steel for cross pieces and

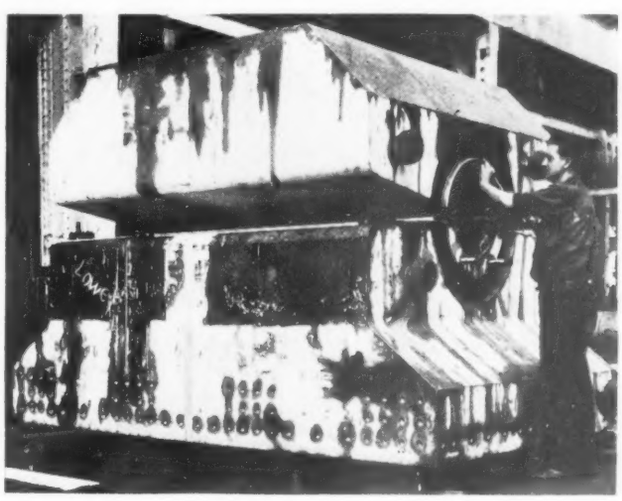
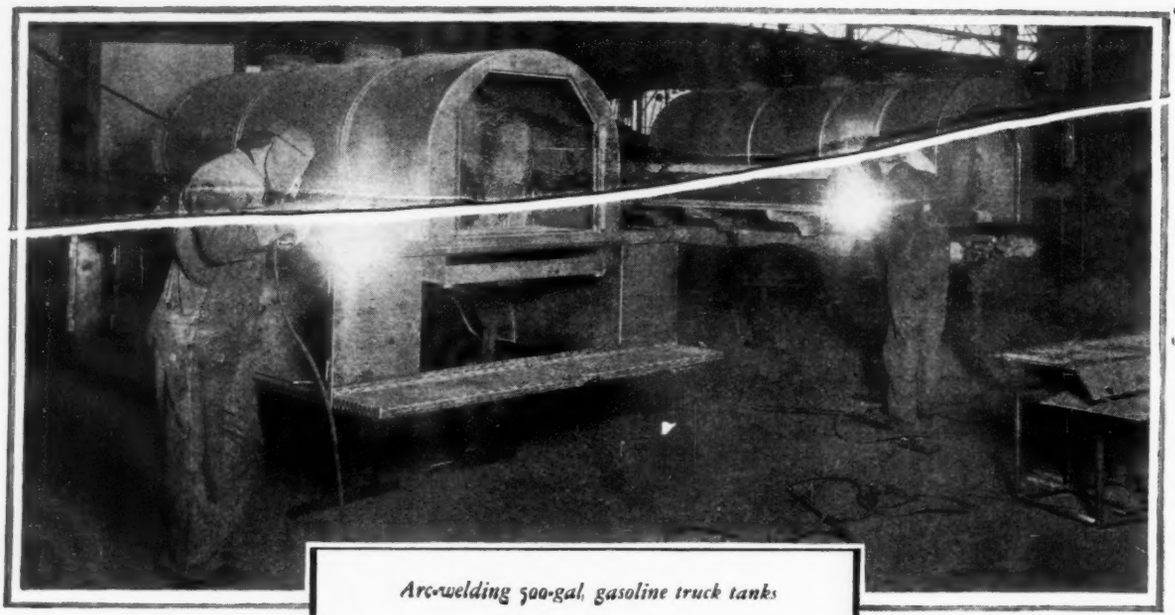
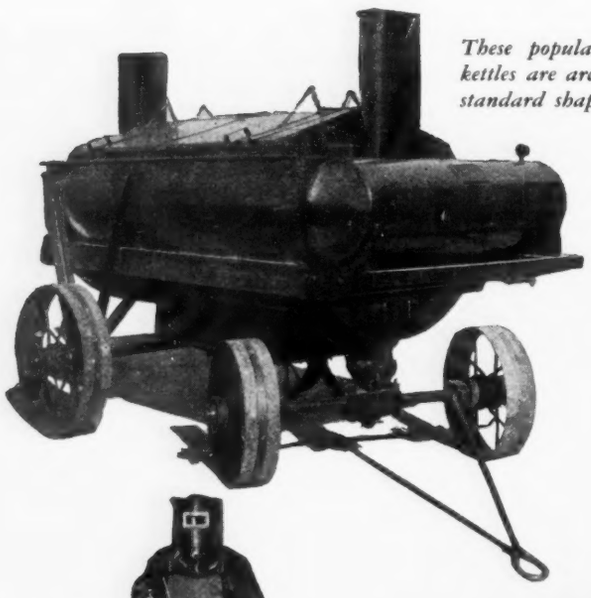


Fig. 3—Forged carbon shoe for one of the hinges assembled after machining

Business is Booming



Arc-welding 500-gal. gasoline truck tanks



These popular tar-heating kettles are arc-welded from standard shapes and plates

510-gal refueling unit for airport service. All arc-welded from blue, annealed steel plates

2500-gal. semi-trailer tank and 2000-gal. trailer tank for bulk haulage of gasoline. All arc-welded from blue annealed steel plates

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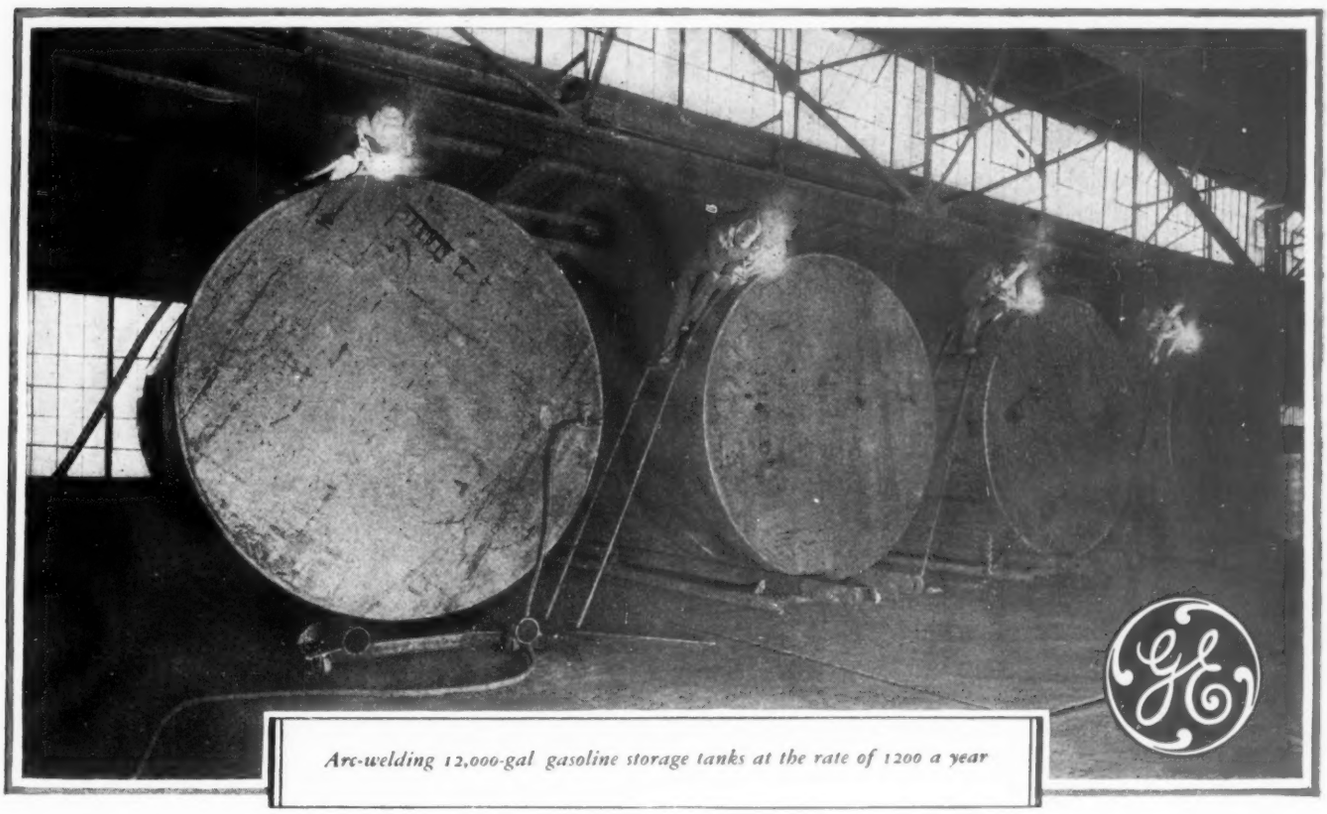
Last year this fabricator arc-welded 1200 bulk oil-storage tanks and over 300 tar-heating kettles—a production which will be exceeded in 1930. Between 1,000 and 1,250 truck tanks and dump bodies will be arc-welded in the current year. In addition, arc-welding forms the basis of construction of a large miscellaneous jobbing business.

Aiding in this program, are eleven modern and thoroughly dependable G-E arc-welding sets—and a welding engineering service promptly available in the nearest G-E sales office.

Forward-looking steel fabricators throughout the country are invited to investigate General Electric's complete arc-welding equipment and engineering facilities. Simply telephone or write your nearest G-E office.



Arc-welding 12,000-gal gasoline storage tanks at the rate of 1200 a year

530-85

ELECTRIC

SALES AND ENGINEERING SERVICE IN PRINCIPAL CITIES

carbon steel for the approaches and for some of the arch members. Some heavy carbon steel forgings were employed in the construction of the shoe.

Fig. 3 shows two of these forgings for one of the hinges after machining at the Kearny, N. J., plant of the Federal Shipbuilding & Dry Dock Co. The hinge pins are also carbon steel forgings and when machined are 16 inches in diameter and 8 feet long. One of these pins is shown in Fig. 2. The machining of one of the large shoe bases is shown in Fig. 4.

Forty per cent of the total steel for the arch has now been erected and the span when completed will be 1652 feet between centers of bearing pins. The thrust from the arch will amount to approximately 30,000 tons on each of the hinges.

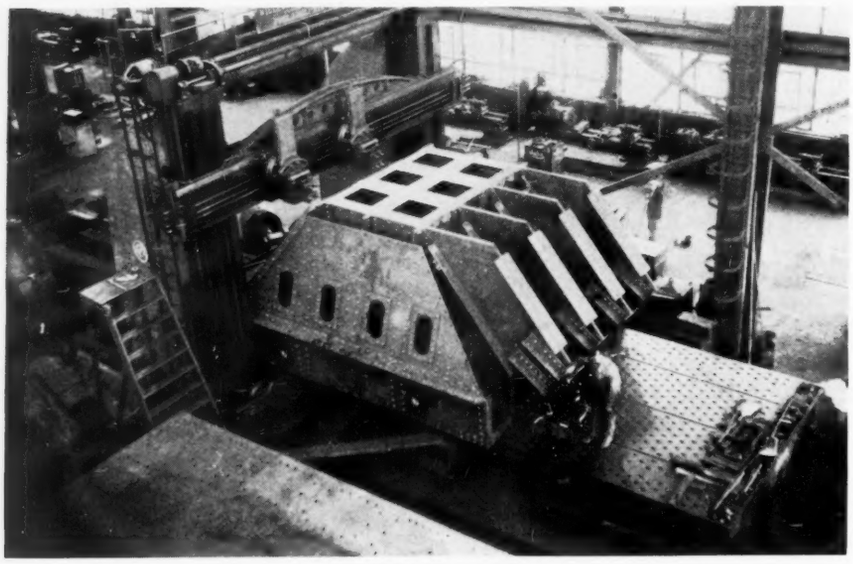


Fig. 4—Planing one of the arch span shoes for the Kill van Kull bridge which will have the largest arch span in the world

Using Corrosion-Resistant Steels in Aircraft

(*Concluded from Page* 54)

liquid air and possibly lower.

This steel is readily forgeable by ordinary methods but is very rigid at forging temperatures and should not be worked, especially in intricate forms, much below 1700 degrees Fahr. While some alteration occurs on long exposure at moderately high temperatures, there is some question as to whether real brittleness develops; pending the accumulation of more data it is well nevertheless to avoid long exposure within the range of 1300 to 1750 degrees Fahr. In use, part of this steel will show no scale formation up to 1600 degrees Fahr. and at this temperature the alloy shows a strength which is a fair proportion of its strength at room temperatures. It may be soldered or brazed but as there is a possibility of intercrystalline penetration of the brazing metal with consequent danger in highly stressed joints or those subjected to moderately high temperatures, welding is to be preferred. The latter method of joining may be readily accomplished and will leave a finished article devoid of brittleness and in most cases possessing satisfactory chemical and mechanical properties in and adjacent to the weld, without further heat treatment.

It is important to note that the coefficient of expansion of this steel is appreciably greater than that of the simple steels and also the plain high-chromium steels, exceeding that of the latter by almost 40 per cent. With the fabricating and mechanical properties just described many uses are to be anticipated and it has therefore been employed in pontoons, in fittings, in stream line wire and in fuselage tubing. While fabrication by steel producers has not by any means been devoid of difficulties, this steel has nevertheless been produced in quantity in many forms: hot-rolled and cold-drawn rods, seamless and welded tubing, sheets, plates, wire, rivets, strip and many other forms.

The low-carbon variety of this same composition possesses most of the desirable qualities of the principal type just described. It does not, however, require the drastic quench for maximum corrosion resistance, is generally softer and more ductile and hardens slightly less readily as a result of working; it has, however, a modulus of elasticity of 1,000,000 or 2,000,000 pounds per square inch less than the higher-carbon type and for like processing lower elastic strength.

The other chromium-nickel types noted are all of the same general character and of particular value because of their resistance to oxidation and their high strength at temperatures well above a red heat. The first two of these three compositions remain practically scale free at 1800 degrees Fahr., while the same is true of the last one at 2000 degrees Fahr., they are still serviceable at 200 degrees Fahr. above these temperatures. Such properties obviously fit them for service as valves, exhaust ports, and similar uses. Unfortunately, they are rigid in forging and extremely difficult to machine and these properties must be given due consideration when determining upon their use.

Commercial Hardening by Cyaniding Process

(*Concluded from Page* 46)

the former would have the deeper case. If both were left in the bath for an hour and the case examined for depth little difference would be noted. The reason for this is that the penetration is rapid for the first few thousandths of an inch but after that the rate of diffusion decreases. At one hour both would reach a maximum depth of about 0.006-inch. The effect of mass is important to consider when hardening work in baskets and fixtures.

The congealing action of the cyanide is regarded by many heat treaters as a distinct advantage by instantly covering the surface of the metal and preventing the shock effect of placing cold metal in a molten bath. It is remarkable the small amount of distortion which results from this process.

It is possible to obtain depths of case in cyanide up to 0.030-inch but the operation is not economical. A depth of 0.011-inch may be obtained by three hours immersion. A depth of 0.003-inch can be obtained in one minute if the steel is heated before immersion. But a depth of 0.006-inch under the same conditions would require one hour. From this period on, the rate of penetration becomes much slower. A case of 0.030-inch would require several days in cyanide.

Increasing the temperature of the bath causes more rapid heating of the work to the carburizing range and increased solubility of carbon in iron. It also produces better diffusion of the carbon into the core as may be noted in those photomicrographs of specimens hardened at various temperatures, reproduced on adjacent pages.

Part II will appear in an early issue of STEEL.

In German practice the standard of cleanness for blast furnace gas is about 0.04 grains dust per cubic foot of gas.

Scanning the Technology of Steel

A Digest of Important Developments in Scientific Research, Engineering Progress and Operating Procedure Pertaining to the Production, Processing, Application and Performance of Steel

USES:

Alloy Steel

Consideration from the scrap standpoint, by E. G. Howell. A paper presented at the June meeting of the National Association of Purchasing Agents, 3 pp.

The scrap industry in point of tonnage has grown to take its place on an equal footing with pig iron, serving as a medium for the conservation of the country's natural resources. Present and prospective development of alloy steels requires that prompt steps be taken to segregate alloy scrap, suggesting the further standardization and modernization of scrap iron specifications.

—STEEL 7-17-30

Noncorrosive Materials

A digest of metals and alloys employed in heat and corrosion resisting materials, by H. D. Phillips, in Blast Furnace and Steel Plant, July, p. 1143, 4 pp., 9 illusts.

Properties and factors to be considered in selecting a material for any particular heat and corrosion resistant project are presented in detail. Important factors for the engineer to watch to secure the maximum life from his equipment are the temperature and pressure of the corroding medium, its aeration, and the superficial condition of the metal used.

—STEEL 7-17-30

Rivets

A bulletin, No. 210, of the engineering experiment station, University of Illinois, Urbana, Ill., 38 pp., 10 illusts., 17 tables.

The report covers the investigation of the strength of rivets in tension and the initial tension in rivets. The strength in tension of hot-driven rivets having two button heads was slightly greater than the tensile strength of the rod from which the rivets were made. Rivets having a long grip were not as strong as those having a short grip. There was no indication of any lack of reliability of rivets subjected to tension. With respect to the initial tension in rivets the tests show that cold-driven rivets had a low initial stress. Rivets having a long grip had a somewhat greater initial stress than those having a short grip. The tests indicate that hot-driven rivets in general are subjected to a tensile stress nearly equal to the yield point strength of the material.

—STEEL 7-17-30

Tungsten Carbide

Use of this metal as a cutting material on heavy machine tools, by Coleman Sellers 3rd., in Mechanical Engineering, p. 683, 7 pp., 15 illusts.

A brief review of the experience of an early user of tungsten-carbide tools on cast iron, in which the author describes the steps taken to introduce this material into the machine shop and the method used to follow up the results obtained. The grinding problem is discussed and the importance of correct grinding is stressed. A few suggestions are given for grinding procedure, clearance angles and shapes of tools. The types of tools used are described. The difficulties are listed with possible remedies for each, and, in contrast, six typical successful applications are described. In conclusion, the advantages and disadvantages are set forth.

—STEEL 7-17-30

FABRICATION:

Circular Saws

Results recently achieved through the use of tungsten-carbide tips brazed to the teeth at the cutting edge of saws, by C. M. Thompson, in Mechanical Engineering, July, p. 681, 2 pp., 2 illusts., 1 table.

Brazing tungsten carbide to steel requires a temperature between 2100 to 2200 degrees Fahr. While this temperature offers difficulties in the case of solid saws yet the inserted-tooth saw lends itself readily to the application of the metal. Saws tipped with this metal are adapted particularly to the cutting of abrasive wall board, slate and asbestos. Tungsten-carbide tipped saws should not be allowed to dull to the extent of having to waste the expensive material by grinding it away, but should be sharpened by lapping as soon as slight dulling of the cutting edges is noticeable.

—STEEL 7-17-30

Welded Trusses

Bridge floor reinforcing of the arc-welded truss type, discussed by H. M. Bringhurst, in Engineering News-Record, July 3, p. 8, 2 illusts.

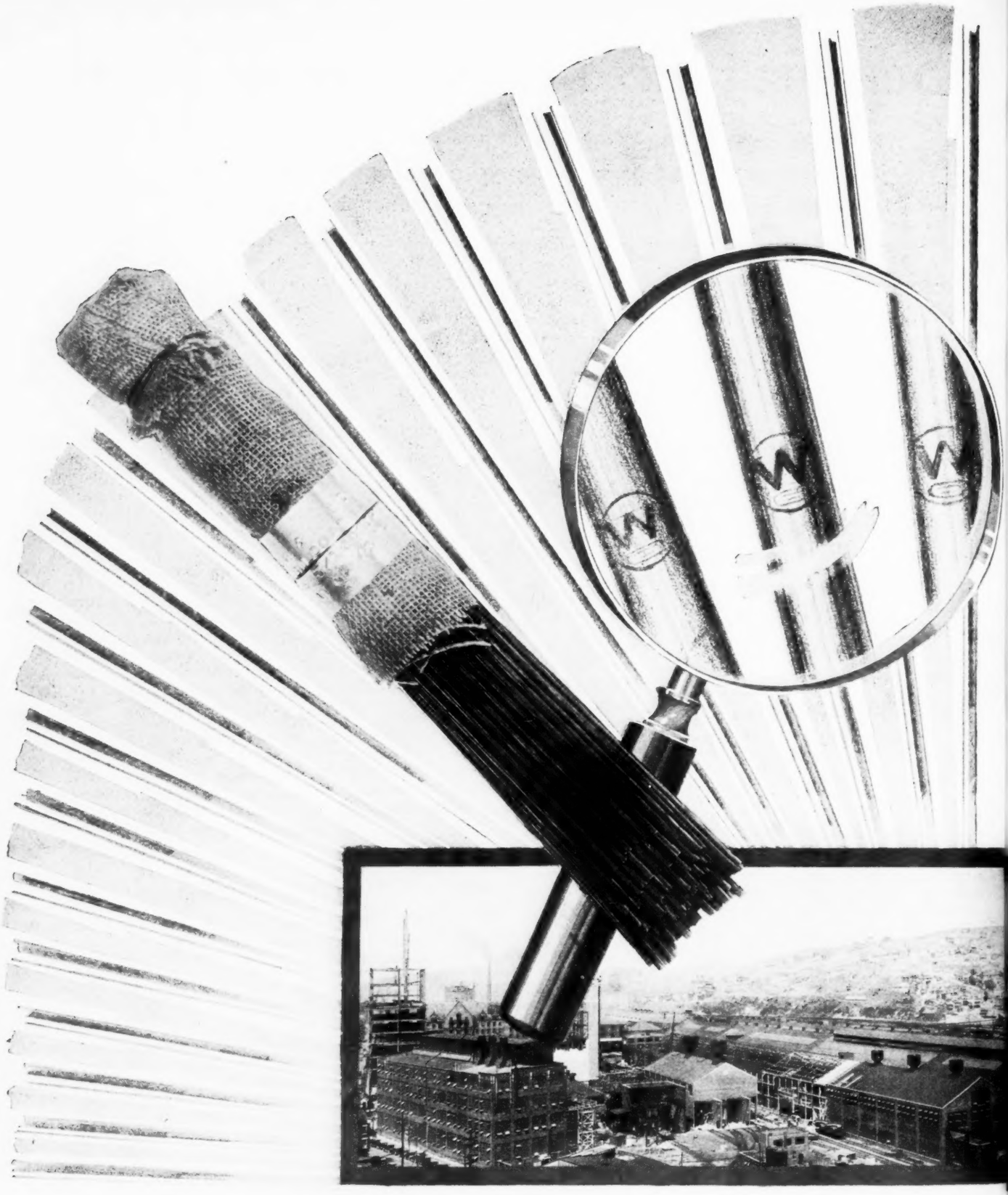
The roadway slab reinforcing used on the new bridge over the Ohio river at Louisville, Ky., and on the Ambassador bridge at Detroit is an interesting example of truss-type reinforcement and represents the first use of arc-welded material on bridges of this size. The bars are furnished by the mills in coils and are straightened to remove the mill scale. The webs are bent on a compressed air bending machine and are spliced to facilitate handling. The bars then are assembled in a jig and each joint is electrically arc-welded by hand. After the truss is removed from the jig each joint is tested with a pinch bar. At irregular intervals trusses are tested to destruction as an additional check. Tests on the sections and results are described.

—STEEL 7-17-30

Tests on Welded Shells

Resistance to repeated pressure of forged, riveted and welded boiler shells, by H. F. Moore. A paper presented at the semiannual meeting of the American Society of Mechanical Engineers in June, 66 pp., 7 illusts., 1 table.

Data regarding the performance of welded joints in resisting repeated stresses are important in any consideration of the adoption of welded construction for power boilers, and this paper presents such data. Comparative tests were made on (1) a standard riveted drum, (2) a manganese steel riveted drum, (3) forged seamless steel shell, (4) two forge and hammer welded shells, and (5) eight fusion welded shells, each drum or shell being subjected to applications of pressure well above the allowable working pressure. Results indicate that under repeated stress properly welded joints are stronger than the plates themselves when weakened by "stress raisers" such as small holes or



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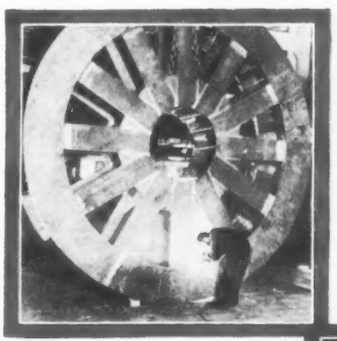

More than 80 experienced operators daily arc weld machinery parts in the Westinghouse large machinery fabrication aisle.

THOUSANDS of tons of cold steel forms are fused into structures, both large and small—other thousands of tons of steel columns and beams reach outward and skyward to form the world's largest completely welded building structure—new manufacturing tools are speedily built from standard steel pieces—old, worn tools are rejuvenated. Such is the picture of the welding activities at the Westinghouse Plant at East Pittsburgh.

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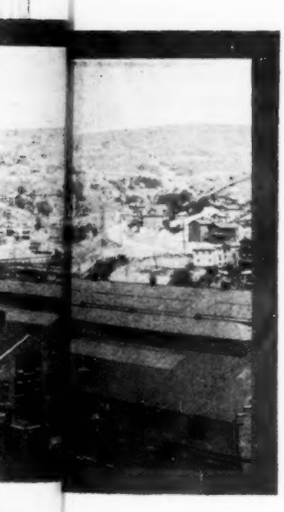

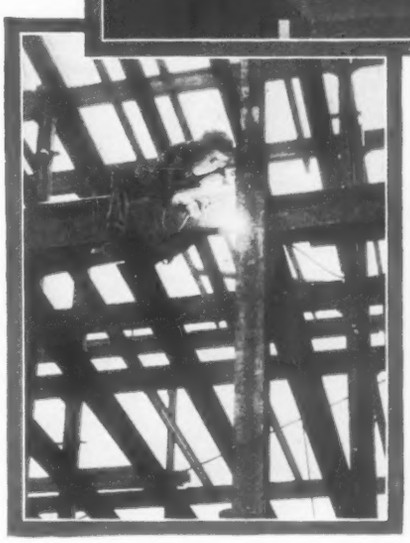

Arc welding a 2000-ton eleven-story Westinghouse structure. This building is described in "The Arc Welding of Structural Steel," S. P. 1879. Write for a copy.

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surface defects. The tests also give useful data on the strength of drum heads when subjected to intermittent pressures.

—STEEL 7-17-30

PRODUCTION:

Die Casting

Variety of work, type of alloys used and important factors in the process discussed by Marc Stern, in American Machinist, June 26, p. 1029, 3 pp., 7 illusts.

Die castings are produced in various alloys and are designated by the metal which predominates, as tin base, lead base, zinc base, and aluminum base. The basis of a good die casting is an alloy. Rigid metallurgical control, therefore, is necessary to determine the percentages of desired ingredients and to eliminate undesirable elements which may be harmful if present in small fractions. The die-casting machine must be flexible to handle with rapidity die castings over a wide range of sizes and shapes and rigid to maintain close dimensions.

—STEEL 7-17-30

Electric Welded Pipe

Arc welding method invented by the A. O. Smith Co., Milwaukee, described in Business Week, July 2, p. 23.

In the Smith process the meeting edges of the unwelded seam are beveled to form a V-groove between them, and an electric arc is struck between a steel wire and the bottom of the groove. The wire electrode is melted by the electric arc and feeds metal into the groove as the arc is moved along the seam. A single arc-welding machine can operate at about 2 feet a minute, but speed is achieved by multiplying the automatically controlled machines. The plant produces about 32 miles of pipe a day. The company doubled the length of the pipe from 20 to a uniform 40 feet, thus saving construction costs.

—STEEL 7-17-30

Structural Steels

Data on manganese structural steels with chromium additions, by A. B. Kinzel and W. B. Miller, in Transactions of the American Society for Steel Treating, July, p. 55, 11½ pp., 7 tables, 7 illusts.

Results of a laboratory study on a series of chromium-manganese steels ranging from 0.08 to 0.50 per cent carbon and 0.6 to 1.8 per cent manganese, with chromium additions from 0.3 to 1.1 per cent. The beneficial effect of chromium is evidenced by the increase of ultimate strength without proportional decrease in ductility. The practical application of such a steel is demonstrated by the construction of a welded pressure vessel and its subsequent test to destruction. The possibility of as-rolled or normalized structural steels with satisfactory ductility and higher strength than the present manganese steel by the addition of small percentages of chromium is indicated.

—STEEL 7-17-30

Welded Steel Tubing

An investigation for determining the physical properties of low-carbon steel tubing in research paper No. 161, bureau of standards, Washington, 25 pp., 24 ills., 9 tables.

Except in the case of swaged-annealed tubing, the properties of the metal not affected by the welding operation can be used in determining the working stresses for different structural uses of tubing made by the process used in the manufacture of this electrically welded tubing, no allowance being necessary for the altered structure in and adjacent to the weld.

—STEEL 7-17-30

MISCELLANEOUS

Wheelbarrows

A bulletin, No. R105-29, of the bureau of standards, Washington.

The report covers simplified practice recommendations including sketches of the barrows of various designs that have been approved. The latter part of the bulletin is devoted to a history of the recommendation.

—STEEL 7-17-30

Floor Tests

Progress report of tests on flat-arch floor systems, by G. E. Large, in Engineering Experiment Station News, Ohio State university, Columbus, O. June, p 8, 1½ pp., 1 illust.

Fireproof floor of the flat-arch type has not generally been used during recent years because of lack of design information. However, work now is underway to secure reliable strength data and to evolve design formulas for the use of structural engineers and designers. Forty-eight floor slabs of steel and tile flat-arch construction have been laid and tested. In the tests the observed stresses in seven rods have been uniform, as have been the deflection measurements, indicating that the load is uniformly distributed across the width of the slabs and that satisfactory readings are being secured. The investigators now have the results of two tests of each tile and steel combination, and are making careful studies of the data.

—STEEL 7-17-30

Scrap and Waste Disposal

Details of reclamation methods discussed by Charles O. Herb, in Machinery, July, p. 841, 6½ pp., 8 illusts.

By-products department of large spark plug company has paid large returns by saving or selling many articles that previously were discarded, by securing higher prices for metal chips and scrap through careful segregation of the different metal compositions, and by preventing the throwing away of spoiled work without the knowledge of the executives.

The income from sweepings alone ranges from $40 to $50 a month. On an annual basis, the increased revenue from careful segregation of metals approximates $100,000. Materials salvaged include barrels and boxes, rags, canvas gloves, chamois cloths, polishing wheels, goggles, oil cans, screwdrivers, lead hammers, solder drippings, files, spray-gun nozzles, cartons, cardboard, steel borings, turnings chips and oil.

—STEEL 7-17-30

Stadium Design

Instructive treatise on the design and construction of such buildings by the American Institute of Steel Construction, New York.

Many facts never before appearing in print have been amassed. The discourse is intended to be of value to the structural engineer and architect commissioned to design a stadium. In text, illustrations, design plans and tables of engineering calculations, the experience of years has been used.

—STEEL 7-17-30

Steelworks Power Plant

A description of Pittsburgh Steel Co.'s new unit by Charles Longenecker, in Blast Furnace and Steel Plant, June, p. 976, 7½ pp., 10 ills., 1 table.

The boilers recently placed in operation are heated with powdered coal and blast furnace gas. Ash, which drops from the gas current in the furnace, falls upon an air-cooled hopper and from this is discharged into a sluicing system. For the purpose of inducing the gases from the boiler a 11-foot diameter fan is employed. The combustion control comprises a centrally located master panel, panels at each boiler, various controllers, regulators and valves to provide complete automatic regulation.

—STEEL 7-17-30

Machine Tools and Shop Equipment

"Without machine tools modern machinery could not be built."

—Joseph W. Roe

Mobile Truck Welding Unit Reduces Waste Time

Clark Tructractor Co., Battle Creek, Mich., has developed a new truck welding unit which is a complete, mobile, self-contained, gas-powered, electric arc welding unit, capable of 24-hour continuous operation. The unit, shown in the accompanying illustration, is especially useful in places and on work where there is no convenient source of electrical power. The truck takes the welding equipment to the work and eliminates waste time in moving from job to job.

The unit is equipped with self-starter and headlights, carries necessary welding accessories, has ample room for acetylene tanks, seating room for the welding crew, and ample power for towing trailers.

Generator Provides Current

Arc welding current, ranging from 60 to 250 amperes at 25 volts, is developed by a self-excited arc welding generator with control, driven by a special heavy-duty, 4-cylinder gas engine developing 20 horsepower at 1480 revolutions per minute. Currents between 25 and 60 amperes may also be obtained by inserting in the circuit a current-reducing resistor provided for the purpose. The current available is ample for use with all commercial sizes of metallic electrodes from 1/16 to 3/16-inch, also for light carbon welding and cutting.

Engine and generator are connected by a 3-inch endless, composition belt. The generator is thrown in and released by a hand controlled belt tightener, a ball bearing idler mounted on sliding ways and located on the driver's platform. Automatic stabilization of the welding arc is provided by a self-adjusting stabilizing reactor. The reactor permits the operator to maintain a steady arc on low as well as on high currents, under all welding conditions. For striking the arc, a high open circuit voltage of 65 volts is available, after which the voltage is automatically reduced to that required to maintain the arc. Adjustments in the range of welding current, from 60 to 250 amperes, are made by shifting the generator brushes by means of an external handle. Further adjustments down to 25 amperes are made by shifting electrode leads.

◆

Hack Saw Blades Designed with Unusually Fine Teeth

"Barsonator" Werkzeug G. m. b. H., Hamburg-Wandsbek, Germany, is manufacturing a new type of hack saw blade which is especially adapted to the cutting of iron and steel. The teeth of the blade are fine at the point, gradually increasing in size until the ordinary dimensions are attained. The result of this is that a finer and lighter cut is obtained when starting to saw and any wedging of the saw in the metal is avoided.

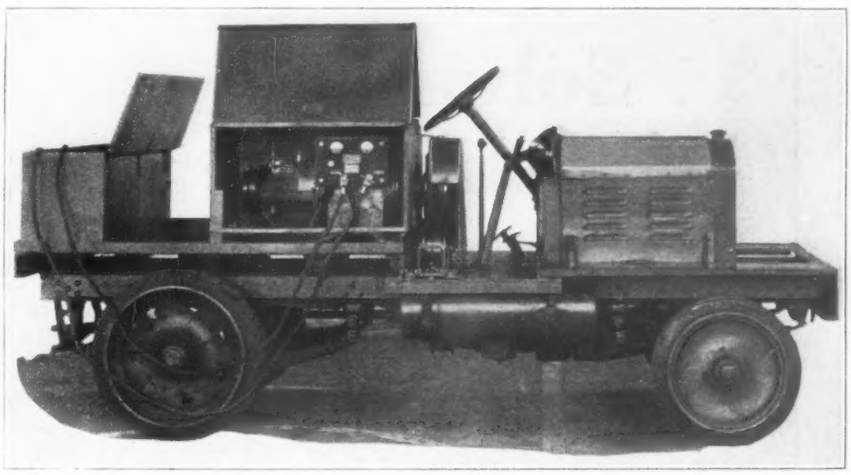
A further advantage of the fine teeth is that the saw can be held exactly on the line without any danger of its slipping out to the side and damaging the material. Also the fine teeth are of material assistance to the power exerted by the workman. The power required at the beginning of a cut is low and increases as the coarser teeth come into use. The blades are made of tungsten steel and are provided with a waved edge.

New Index Bases Control Table Movements

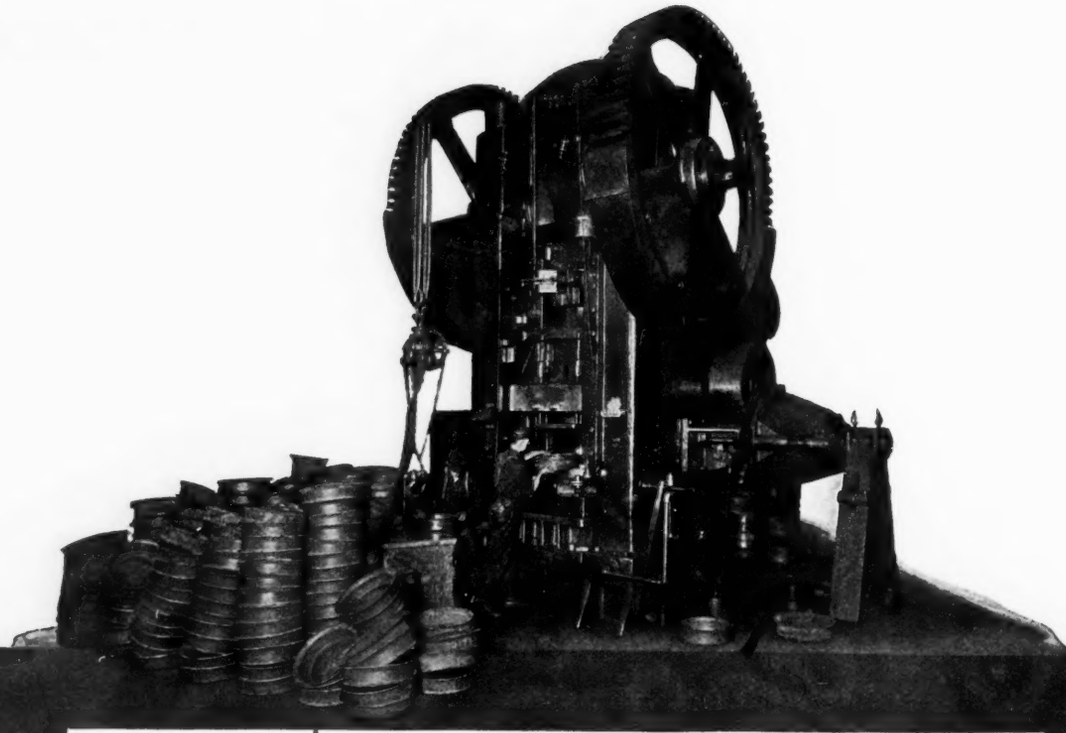
Brown & Sharpe Mfg. Co., Providence, R. I., has developed additional standard index bases, new milling machine attachments, which are designed primarily for use on machines which possess automatic or semiautomatic table movements. The new device consists of a heavy base, bolted to the table of the machine, on which is mounted a swivel. The swivel rotates on a heavy pivot and is locked and held rigidly in position by a taper plunger operated by a hand lever. It can be indexed through 360 degrees, with working positions at 0 and 180 degrees. The contact surfaces are scraped, assuring correct alignment and rigidity.

The bases are furnished with a reversible tongue for aligning them on the table of the milling machine. A tongue slot for aligning fixtures is cut on the swivel while the fixtures are bolted and doweled to the swivel in accordance with the requirement of the job to be done.

The tool has its most important use on jobs when semiautomatic table movements are used, where the leading time is equal or greater than the cutting time. It is arranged with a fixture at each end of the swivel and while the work in one fixture is be-



Complete welding unit receives power from truck which transports it



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No. 560

ing milled, the fixture on the other end is being loaded. Upon completion of the cut, when the table returns to the loading position, the swivel is indexed, bringing the fixture on the opposite end into working position, and the machine is again set in operation.

◆

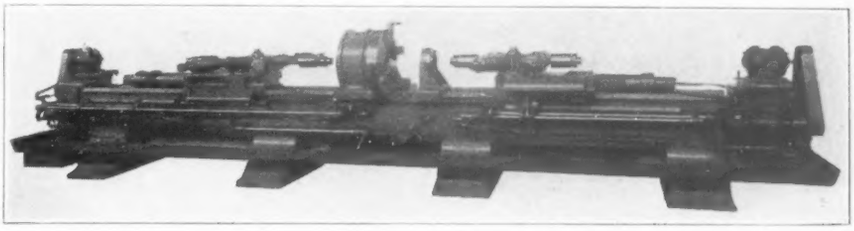
Air Hammer Will Deliver Single or Set Blows

Nazel Engineering & Machine Works, Philadelphia, has developed a self-contained motor-driven air hammer, shown in the accompanying illustration, which will deliver single and set blows with precision in addition to variable and automatic blows. This new hammer has been introduced to meet the increased demand for larger motor-driven hammers for all types of general forging. The hammer shown has the following specifications: Efficient capacity, 13-inch square; blows per minute, 100; requisite motor, 75 horsepower; stroke of ram, 32¼ inches; distance between guides, clear working space, 32¼ inches; from center of ram to housing, 29½ inches; weight of hammer without anvil, 46,000 pounds; weight of anvil, bolster and die, 26,000 pounds and total weight 72,000 pounds.

◆

Duplex Machine Performs Multiple Operations

Foster Machine Co., Elkhart, Ind., has designed a machine to provide for the simultaneous performance of boring, facing, chamfering and turning operations in the bore of wheels for agricultural machinery. In the operation of this machine, shown in the accompanying illustration, the work is chucked on a head mounted at the middle of the machine where it is possible to bring two sets of tools, carried by the turrets, into simultaneous engagement with opposite sides of the work, thereby enabling machining operations to proceed simultaneously and finish the bore in both sides at a single setting.



Simultaneous operations are performed on this duplex machine

This machine is essentially the same as two sets of standard turrets, mounted at either side of the special head so that they may engage the work from both sides. The sequence of operations to be performed at either side of the bore consists of facing the outside of the hub, boring the cavity and facing a flange at the inner end of the bore on each side of the hub. This work is divided up into rough boring and facing; finish boring, facing and chamfering; and a final reaming operation. Obviously there are three steps in the cycle and each turret is equipped with two sets of three tools each. Thus it is unnecessary to index the turret back to the starting position after it has reached the third step, the next index of the turret providing for bringing the next set of roughing tools in the operating position.

In operation, the machine is run automatically, a series of cams providing for the rapid advance of the tools to the work, then changing to the required feed movement after which the tools are withdrawn rapidly and the turret indexed to the next station when the same sequence of movements is repeated. At the conclusion of the cycle, the machine is automatically tripped to a neutral position and after the finished piece has been removed from the chuck and a new part to be machined substituted, lifting of a control lever at either side of the head provides for the next cycle to start.

◆

Multiple Cords Carry Load in New Belt Drive

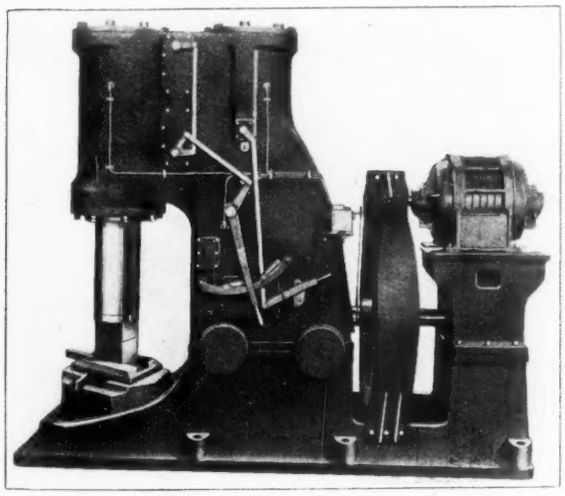
Worthington Pump & Machinery Corp., Harrison, N. J., has developed, in conjunction with the Goodyear Tire & Rubber Co., a new type of machine drive. This drive consists of a number of endless molded V-belts running in V-grooved sheaves. It combines a new type of rubberizer cord V-belt, impervious to dust and moisture, with an improved V-grooved sheave. The load-carrying members are high-grade cotton cords arranged in parallel lines and concentrated about the neutral axis.

Each sheave is carefully grooved machined and finished so that the grooves present a smooth surface on which the belts run. The wedging action between the belts and the grooves results in a slipless, powerful grip which compensates for, but differs from, initial belt tension in a flat belt drive. The smooth-grooved construction of this drive, together with the fact that there is an exact mathematical relationship between the grooves and the molded shape of the V-belts, is claimed to give a positive grip, without binding or backlash, said to transmit about 99 per cent of the applied power at high-speed ratios, over short centers without idlers.

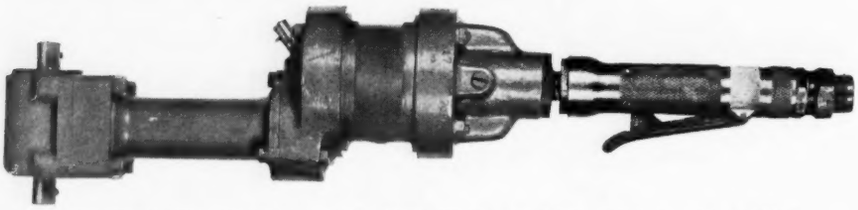
◆

High-Speed Grinder, Nut Setter New Air Tools

Buckeye Portable Tool Co., Dayton, O., has developed two new air tools which are easily adaptable to many types of work, a high-speed grinder and a new type nut setter. The grind-



Single and set blows may be delivered with precision by this new self-contained motor-driven air hammer



Pneumatic nut setter is especially adapted for close quarter nut driving

er is especially adapted for use with small emery wheels, emery pencils, rotary files, etc., and can be used in close quarters. It weighs only 3½ pounds and runs at a free speed of 22,000 revolutions per minute. This tool has a throttle and rear head in one piece, and the throttle is of a new type that can be operated with a touch of the thumb. With the extension shaft spindle off, this tool measures 12 inches.

The nut setter, shown in the accompanying illustration, is known as a right-angle nut driver. Especially designed for close quarter nut driving, it can be used in railroad shops as well as on other work. It is furnished in two speeds, 660 and 1000 revolutions per minute, and is intended for driving ½-inch nuts and ⅝-inch cap screws. The tool is 21 inches in length and weighs 11¼ pounds.

◆

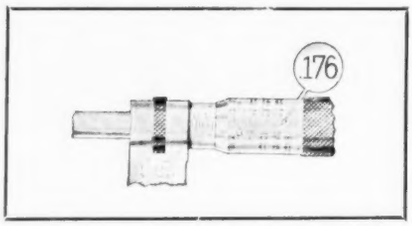
Skid Platforms Are Built for Heavy Service

Truscon Steel Co., Cleveland, has improved its line of skid platforms by the addition of an integral rib reinforcement in each panel. This rib forms a brace for the legs, increases the strength of the platform with no increase in weight and holds the legs true even when the platform is greatly overloaded. The platforms are built with doubly reinforced corners designed to withstand hard usage. They can be easily picked up and transported from place to place. The steel ribbed boxes which are part of the equipment are built in a number of different types for practically all uses. They may be built to any height by adding sections or may be obtained with an end door or mounted on casters for easy moving.

◆

Single Reading Gives Total Micrometer Measurement

Lufkin Rule Co., Saginaw, Mich., has announced a distinctly new method of marking a micrometer. This tool, shown in the accompanying illustration, gives the total reading of the measurement without the necessity for additions. The reading is shown at a glance by an ingenious arrangement of figures on the sleeve. The hub markings are the same as on the regular type of micrometer. The hundreds of thousandths are indicated by a long line, the reading shown as usual by figures 0 to 9. The three shorter lines indicate 0.025, 0.050 and 0.075



Unique method of marking simplifies reading of new micrometer

inches, being arranged so that they appear as a group of three.

The sleeve is notched or cut away at the zero point so that at each revolution of the spindle a new line comes instantly into view when zero is reached. On the sleeve a row of figures from 0 to 24 is shown on the edge. A group of three rows of figures indicating 25 to 49, 50 to 74 and 75 to 99 is shown at the right, so arranged in spiral form that each row follows the last without jumping over.

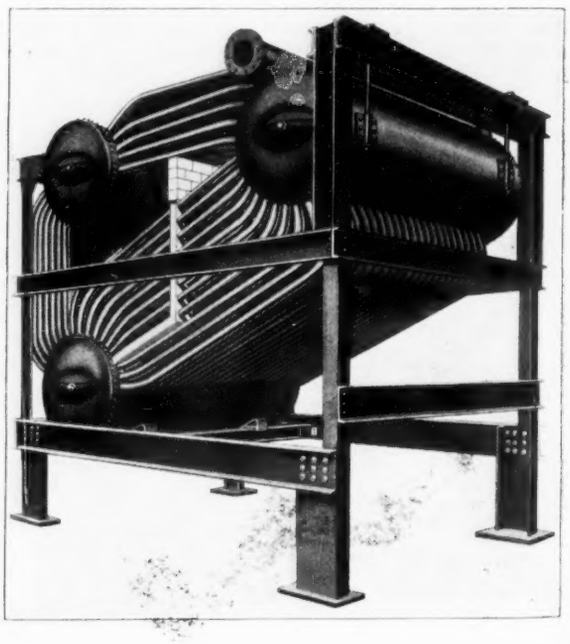
◆

Boilers Designed for Users of Small Amounts of Steam

Erie City Iron Works, Erie, Pa., is announcing a new series of 3-drum boilers, designed for the small and medium size plant using steam and available in sizes from 80 horsepower up, for steam working pressures up to 350 pounds. A special arrangement of baffles is used, which deflects the hot gases over every inch of heating surface in the boiler, thus gradually lowering their temperature until in the last pass an insulated steel plate rear wall is entirely adequate.

The ability to produce slightly superheated steam, as found in earlier designs of these boilers, is retained in this new low headroom unit, shown in the accompanying illustration, by the use of a horizontal steam header or manifold which is connected to the rear steam drum by a number of superheating tubes. Slightly superheated steam is discharged into the main steam line horizontally from the end of this header, an arrangement that reduces the headroom considerably.

Another innovation is the elimination of the customary rear brick wall and the substitution of well insulated removable plates. Easy and quick access can be had to the entire rear of the boiler by removing these plates. Many of the smaller sizes may be shipped as a unit.



Users of small amounts of steam are accommodated by this 3-drum boiler which has special baffle arrangement

Steel Consumption at Year's Low

Shutdowns Make July a Half Month but Slight Rebound Probable—Low Prices Spur Structural Demand—More Activity in Plates

STEEL consumption is slumping this week and next to the lowest point since the year-end cessation. Fully half of the automobile manufacturing capacity of the country and a commensurate number of parts makers have shut down for two weeks; so important a railroad as the New York Central has closed its shops for ten days; so typical an industrial as Western Electric is idle for two weeks.

For the steel industry, this is a condition which declining production and shipments of the past 30 days have been anticipating. There is, therefore, some opinion that the low point of demand, for the immediate present at least, is passing. Production in some finished lines will show modest improvement the next few days to satisfy releases for consumers resuming about Aug. 1.

In its broad aspects, however, there is nothing to warrant expectation of decided betterment this month or next. Some steelmaking interests have canvassed the situation and concluded that no broader commitments for raw materials are required prior to September. A possible exception is the moderate purchasing of scrap by some Pittsburgh district steelmakers who are not certain scrap is scraping bottom and hence desire some stock as insurance.

While steel prices continue irregular, the extent of the decline from the 1929 high is more widely realized. Increased activity in structural steel undoubtedly is recognition of bargain levels. Structural awards this week, exceeding 56,000 tons, were the fourth highest this year and 50 per cent above the year's weekly average. Larger lettings included two subway sections in New York, requiring 14,820 and 4350 tons, respectively, and two New York office buildings taking a total of 7500 tons.

Absence of carbuilding requirements leaves a large gap in plate orders, but demand in other directions is moderate. Preliminary bids have been asked on two United States Lines steamers, each requiring 28,000 to 30,000 tons, chiefly plates. At New York, two pipe lines specify 9000 tons and tunnel work 4000 tons. At Chicago, pending tank work aggregates 12,000 tons. Some line pipe business is retarded because plate and skelp mills cannot make desired delivery.

Those steel lines closest to the automobile situation are the most torpid. Specialty lines in sheets are moving well, in contrast to autobody sheets, for which only Ford has measurable releases out. Strip, wire and cold finished bars are lagging behind June. Carbon bars are having a good week at Chicago, but this is appraised as a spurt rather than a trend.

Raw materials are as dull as finished products. An important steelmaker at Pittsburgh has bought 10,000 tons of steel scrap at $15. Beehive coke output, further restricted, has not been so low this year. Recent reductions in pig iron, especially the 50-cent cut in the Mahoning valley, have not enticed buyers. Southern iron is offered at Cincinnati for $12.50, Birmingham, or 50 cents less. Two merchant stacks at Buffalo have been banked.

Steelmaking operations at Pittsburgh and Chicago, at 60 per cent, show slight losses from last week. Youngstown mills hold at about 60 per cent. Cleveland operations are up six points, to 50 per cent. Buffalo also shows a six-point gain from 48 to 54 per cent. Steel corporation subsidiaries this week average 63 per cent and independents 52, giving the industry an average of 57 per cent. This compares with 64 per cent the week before July 4.

When unfilled tonnage of the United States Steel Corp. June 30 declined only 2 per cent from May 30, to 3,968,064 tons, the lowest backlog since last Sept. 30, it indicated that production had been retarded as sharply as buying.

A further recession of 14 cents in STEEL'S iron and steel market composite, formerly that of Iron Trade Review, lowers this index to $33.18, a level not plumbed since March 22, 1922. The June average was $33.53 and last July $36.71.

Composite Market Averages

Based on Pig Iron, Billets, Slabs, Sheet Bars, Wire Rods, Steel Bars, Plates, Structural Shapes, Black, Galvanized and Blue Annealed Sheets, Tin Plate, Wire Nails and Black Pipe.

This week (July 16, 1930)	**$33.18**
Last week (July 9, 1930)	**33.32**
One month ago (June, 1930)	**33.53**
Three months ago (April, 1930)	**34.44**
One year ago (July, 1929)	**36.71**
Ten years ago (July, 1920)	**68.29**

Comparative Prices of Iron, Steel and Coke

Representative Market Figures for This Week, Last Month, Three Months and One Year Ago

	July 16, 1930	June, 1930	April, 1930	July, 1929
PIG IRON				
Bessemer, del. Pittsburgh	$20.26	20.76	20.76	20.76
Basic, valley	18.00	18.50	18.50	18.50
Basic, eastern del. eastern Pa.	18.25	18.75	18.76	19.85
No. 2 foundry, del. Pittsburgh	19.76	19.76	19.76	19.76
No. 2 foundry, Chicago	18.00	18.40	19.40	20.00
*Southern No. 2, Birmingham	14.00	14.00	14.00	14.40
**No. 2X, Virginia Furnace	18.25	18.25	18.25	20.00
**No. 2X, Eastern del. Phila.	20.26	20.26	20.76	22.26
Malleable, valley	18.50	19.00	19.00	19.00
Malleable, Chicago	18.00	18.40	19.40	20.00
Lake Superior, charcoal, del. Chi.	27.04	24.04	27.04	27.04
Gray forge, del. Pittsburgh	18.63	19.13	19.13	19.13
Ferromanganese, del. Pittsburgh	103.79	103.79	103.79	109.79

*1.75 to 2.25 silicon. For local delivery. Northern shipments based on $12 to $13, Birmingham. **2.25 to 2.75 silicon.

COKE				
Connellsville furnace, ovens	2.50	2.50	2.60	2.75
Connellsville foundry, ovens	3.50	3.50	3.50	3.75
SEMIFINISHED MATERIAL				
Sheet bars, open-hearth, Youngs.	31.00	31.25	33.00	35.00
Sheet bars, open-hearth, Pitts.	31.00	31.25	33.00	35.00
Billets, open-hearth, Pittsburgh	31.00	31.25	33.00	35.00
Wire rods, Pittsburgh	36.00	36.00	38.00	42.00

	July 16, 1930	June, 1930	April, 1930	July, 1929
FINISHED MATERIAL				
Steel bars, Pittsburgh	1.70	1.75	1.80	1.95
Steel bars, Chicago	1.80	1.85	1.90	2.05
Steel bars, Philadelphia	1.94	2.04	2.12	2.27
Iron bars, Chicago	1.90	1.90	1.95	2.05
Shapes, Pittsburgh	1.65	1.70	1.80	1.95
Shapes, Philadelphia	1.71½	1.77	1.81	2.06
Shapes, Chicago	1.80	1.80	1.90	2.05
Tank plates, Pittsburgh	1.65	1.70	1.80	1.95
Tank plates, Philadelphia	1.85½	1.91	1.95	2.15
Tank plates, Chicago	1.80	1.80	1.90	2.05
Sheets, blue anl., No. 13, Pitts.	2.15	2.15	2.25	2.20
Sheets, black, No. 24, Pitts.	2.55	2.55	2.65	2.85
Sheets, gal., No. 24, Pittsburgh	3.15	3.20	3.30	3 60
Sheets, black, No. 24, Chicago	2.70	2.70	2.80	3.10
Sheets, blue anl., No. 13, Chicago	2.30	2.30	2.40	2.50
Sheets, galvanized, No. 24, Chi.	3.35	3.35	3.45	3.85
Plain wire, Pittsburgh	2.30	2.30	2.40	2.50
Wire nails, Pittsburgh	2.10	2.15	2.25	2.65
Tin plate, per base box, Pitts.	5.25	5.25	5.25	5.35
SCRAP				
Heavy melting steel, Pittsburgh	15.00	15.10	16.05	18.45
Heavy melting steel, eastern Pa.	12.50	13.25	13.95	16.50
Heavy melting steel, Chicago	12.00	12.05	13.00	14.75
No. 1 wrought, eastern Pa.	15.25	15.25	15.75	16.25
No. 1 wrought, Chicago	11.25	11.50	13.30	14.85
Rails for rolling, Chicago	14.50	14.55	15.00	17.50

Sheets

Business Shows Moderate Gain Over June—Automotive Tonnage Still Lacking

SHEET PRICES, PAGE 79

New York—Sheet prices are generally unchanged, although on black sheets some shading is noted. While 2.50c to 2.55c, Pittsburgh, covers the bulk of the business, 2.45c is reported on particularly high extras and attractive tonnages. Galvanized sheets are firm at 3.15c, ranging to 3.10c to jobbers. Only large tonnages move at the lower price. Blue annealed sheets are unchanged at 2.15c, Pittsburgh, and blue annealed plates are 2.00c. Volume is not heavy and little advance contracting has been done.

Buffalo—District sheet producers will operate at 70 to 75 per cent of capacity this week, a substantial increase over early July. General buying is improving slowly.

Pittsburgh—Sheet business is slightly more active than recently and shows a moderate gain over the June rate. Forward buying by the automotive industry is quiet, being restricted to Ford, with some uncertainty existing as to the extent of current shutdowns by other interests. Drum and barrel manufacturers still are fair buyers, but little tonnage is coming from freight car builders and export business continues dull. Prices are unchanged but lack strength, with mills usually quoting 2.55c on black sheets, 3.15c and 3.20c on galvanized, and 2.00c and 2.15c on blue annealed plates and sheets, respectively. Autobody sheets are 3.60c. Mill operations hold around 50 per cent, with the leading interest a few points above this average.

Philadelphia—Sentiment in the sheet and strip market is more cheerful, but this is caused more by prospects than by actual increase in consumption. Prices are unchanged.

Cleveland—Some users of autobody sheets have released tonnage on which shipment was suspended two weeks ago. A little new inquiry is noted. Sellers here are adhering to 3.60c, Pittsburgh, and are not waiving extras. Some fabricators of office furniture have ordered sheets at 3.70c. A few steel barrel manufacturers have been buying black sheets in lots of 200 to 350 tons at a time, paying 2.55c, Pittsburgh, compared with 2.45c and 2.40c paid by some automotive users of common black sheets.

Youngstown, O.—Makers of steel sheet specialties continue to receive a fair amount of new business. A number of mills making common grades have not resumed operations since July 4, and see little prospect of resuming this month. Operations as a whole in this district are unchanged from last week, at about 40 to 45 per cent.

The firmest grade of sheets appears to be autobody and furniture, holding at 3.60c, Pittsburgh. Common black have shown a tendency to soften from 2.55c, Pittsburgh, and sales have been made at 2.50c and 2.45c. Galvanized and blue annealed sheet business is negligible at ruling quotations.

Cincinnati—Specifications on road construction jobs have been fairly heavy, accounting in part for 40 per cent production schedules in district sheet mills.

Chicago—Sheet mills are operating at 70 per cent, against 80 per cent a week ago and 50 per cent in the preceding week. One producer has its Indiana Harbor hot mills down for two days this week. Moderate orders have been received. Mill prices for all grades remain nominal on the basis of 2.65c for No. 24 black, 3.30c for No. 24 galvanized and 2.10c for No. 10 blue annealed.

St. Louis—Sheet producers and distributors say the market is quiet, but steady. No decline or improvement has been noted for several weeks.

Birmingham, Ala.—Sheet mills in this district are operating at about 50 per cent. Demand is quiet.

Current Finished Steel Prices

Prices in cents per pound unless otherwise stated

Steel Sheets

SHEET MILL BLACK, NO. 24

Pittsburgh base	2.45c to 2.55c
Detroit, delivered	2.76½c to 2.81½c
Philadelphia, delivered	2.84c
Gary, Indiana Harbor	2.65c
Chicago, delivered	2.70c
Birmingham, base	2.70c
St. Louis, del.	2.97c

TIN MILL BLACK NO. 28

Pittsburgh, base	2.80c to 2.90c
Gary, base	2.90c to 3.00c

GALVANIZED NO. 24

Pittsburgh, base	3.15c
Philadelphia, delivered	3.44c
Gary, Indiana Harbor	3.30c
Chicago, delivered	3.35c
Birmingham, base	3.35c
St. Louis, del.	3.62c

BLUE ANNEALED SHEETS NO. 13

Pittsburgh, base*	1.95c to 2.15c
Chicago, district mills	2.25c
Chicago, delivered	2.30c
St. Louis, delivered	2.57c
Philadelphia, delivered	2.44c
Birmingham	2.30c to 2.35c

*Minimum price is for cont. mill.

BLUE ANNEALED PLATES, NO. 9-10

Pittsburgh, base*	1.80c to 2.00c
Chicago, district mills	2.10c
Chicago, delivered	2.15c
Philadelphia, delivered	2.29c
St. Louis, delivered	2.42c
Birmingham	2.15c to 2.20c

*Minimum price is for cont. mill.

AUTOMOBILE NO. 20

Pittsburgh, base	3.60c
Detroit, delivered	3.86½c

FURNITURE NO. 24

Pittsburgh	3.70c

Tin and Terne Plate

Prices per 100-pound box Pittsburgh

*Tin plate, coke base	$5.25

Gary, Ind., base 10 cents higher.

Long ternes, primes, No. 24	3.65c to 3.75c

*Price subject to quantity differentials.

Wire Products

(To Jobbers-Merchant Trade)

F.o.b. Pittsburgh, Cleveland base
(Per 100 pound keg)

Standard wire nails	$2.10-2.15 and 2.25
Cement coated nails	2.15 and 2.25
Galvanized nails	4.15 and 4.25

(Per pound)

Polished staples	2.60c and 2.70c
Galvanized staples	2.85c and 2.95c
Barbed wire, gal.	2.80c and 2.90c
Annealed fence wire	2.30c and 2.40c
Galvanized wire	2.75c and 2.85c

Woven wire fencing, retailers, Pittsburgh-Cleveland, net ton $65.

(To Manufacturing Trade)

Bright plain wire, 6 to 9 gage	2.30c
Spring wire	3.30c
Wire, delivered Detroit	2.53½c
Nails, delivered Detroit	$2.38½

Joliet, DeKalb, Waukegan, Ill., Anderson, Ind., Chicago, $1 per ton over Pitts.-Cleve.; Duluth and Worcester, Mass., $2 higher; Fairfield, Ala., $3 higher.

Steel Plates

Pittsburgh, base	1.65c to 1.70c
Philadelphia, del.	1.80½c to 1.85½c
New York, del.	1.88c to 1.93c
Boston, del.	2.05c
Chicago, base	1.75c to 1.80c
Cleveland, delivered	1.83½c to 1.88½c
Lackawanna, N. Y., base	1.80c
Birmingham, base	1.90c
Coatesville, Pa., base	1.75c
Pacific Coast, c.i.f.	2.25c
St. Louis del.	2.12c
Detroit, del.	1.91½c to 1.96½c

Structural Shapes

Pittsburgh, base	1.65c to 1.70c
Philadelphia, del.	1.66½c to 1.76½c
New York, del.	1.85½c to 2.03½c
Boston, del.	1.98½c to 2.08½c
Chicago, base	1.75c to 1.80c
Cleveland, delivered	1.83¼c to 1.88½c
Lackawanna, N. Y.	1.80c
Birmingham, base	1.90c
Pacific Coast, c.i.f.	2.35c
Detroit, del.	1.91½c to 1.96½c

Bars

SOFT STEEL

Pittsburgh, base	1.65c to 17.5c
Chicago, base	1.75c to 1.80c
Birmingham, base	1.90c
Lackawanna, N. Y., base	1.85c
Pacific Coast, c.i.f.	2.35c
Cleveland, base, local mills	1.70c to 1.75c
Cleveland, del, outside mills	1.77½c to 1.82½c
Philadelphia, del.	1.99c to 2.04c
New York, delivered	1.98c to 2.08c
Boston, delivered	2.05c to 2.15c
Detroit, del.	1.95c to 1.98¼c
Pittsburgh, cold finish	1.90c
Pittsburgh, forg. qual.	2.00c

RAIL, STEEL

Chicago Heights	1.75c
Eastern mills	1.65c to 1.70c

IRON

Chicago, base	1.90c
New York, delivered	1.98c to 2.03c
Philadelphia, delivered	1.99c to 2.04c
Pittsburgh, refined	2.75c to 4.25c

REINFORCING

Pittsburgh, billet cut lengths	2.00c
Stock lengths, mill	1.75c
Chi. billet, over 500 tons	1.85c
30 to 500 tons	2.00c
Under 30 tons	2.45c
Chicago, rail steel	1.65c to 1.70c
Road and bridge work	1.65c to 1.70c
Philadelphia, cut lengths	2.14c

Cold-Finished Steel

Bars, drawn or rolled, Pitts., Chi., Buff.	2.10c
Cleveland	2.00c to 2.10c
Do. delivered, Detroit	2.20c
Shafting (turned, polished) Pitts., Buffalo	2.10c
Shafting (turned, ground) mill	2.45c to 2.90c

(Depending on size, 1 3/16 to 7-inch)

Cut Nails

Carloads, f.o.b. mills	2.45c
Less-c.l., f.o.b. mills	2.55c

Chain

PROOF BB AND BBB, Pittsburgh

3/16 to ½-inch	33 1/3 and 5 off
9/16 to 1½-inch	33 1/3 off

Alloy Steel

Hot Rolled—F.o.b. Mills

Alloy Quality Bar Base is 2.65c

S.A.E. Series Number	Alloy differentials	Net 100 lb. bars
2000	0.25	$2.90
2100	0.55	3.20
2300	1.50	4.15
2500	2.25	4.90
3100	0.55	3.20
3200	1.35	4.00
3300	3.80	6.45
3400	3.20	5.85
4100 0.15-0.25 Mo.	0.50	3.15
4100 0.25-0.40 Mo	0.70	3.35
4600 0.20-0.30 Mo. 1.25-1.75 Ni.	1.05	3.70
5100 0.60-0.90 Cr.	0.35	3.00
5100 0.80-1.10 Cr.	0.45	3.10
5100 Chr. spring.	0.20	2.85
6100 Bars	1.20	3.85
6100 Spring Steel	0.95	3.60
Chrome, Ni., Van.	1.50	4.15
Carbon Vanadium	0.95	3.60
9250 (flats)	0.25	2.90
9250 (rds., squrs.)	0.50	3.15

Corrosion, Heat Resist. Alloys

Base, Pittsburgh

18 per cent chrome, 8 per cent nickel

Sheets 35c; plates 31c; bars 28c.

	A	B	C	D
Bars	19c	20.5c	23c	28c
Plates	22c	23.5c	26c	31c
Sheets	26c	27.5c	30c	35c
Hot strip	19c	20.5c	23c	28c
Cold strip	28c	29.5c	32c	37c

Carbon 0.12 and under; no nickel. A has chrome 15% and under, B over 15/18% inc., C over 18/23% inc., D over 23/30%.

Strip, Hoops, Bands

Hot strip, to 6-in., Pitts.	1.75c to 1.80c
Delivered, Detroit	2.01½c
Hot strip 6 1/16 to 24-in., Pitts.	1.65c to 1.70c
Delivered, Detroit	1.91½c
Hot strip, bands 6 in. and under, Chicago	1.90c
Do. 6 1/16 to 24 in.	1.80c
Cooperage stocks, Pitts.	2.00c to 2.10c
Do. Chicago	2.10c to 2.20c
Cold rolled strip., Pitts., Cleve., 3 tons and over.	2.45c
Delivered, Detroit	2.65c
Worcester, Mass., (3 tons and over)	2.60c to 2.70c

Rails, Track Material

Standard bess. and open hearth rails, mill	$43.00
Relay rails, Pitts., 60 to 90 lb.	$24.00 to 28.00
Light rails, 25-45, mills	$34.00
Angle bars, Chicago base	2.75c
Spikes, railroad, mills	2.80c
Spikes, railroad, 7/16-in. and smaller, Pitts.	2.80c
Spikes, boat and barge, Pittsburgh	3.00c
Spikes, railroad, Chi.	2.80c
Track bolts, Pitts., steam roads	3.80c
Track bolts, Pitts., stand. jobbers	75 off list
Track bolts, Chicago	3.80c
Tie plates, mills	$41.50

Sheet Piling

Base, Pittsburgh	2.00c to 2.10c

Bars

Slight Bulge in Orders at Chicago—Minimum of 1.65c, Pittsburgh, Applies on Large Lots

BAR PRICES, PAGE 79

Chicago—Several more vigorous orders from several automobile and parts makers are reported by one bar mill, without indication that this represents anything more than a spurt, tying in with automobile model changes. Vacations and inventories are having a pronounced effect on mill orders, and the implement and tractor outlook has not clarified for autumn. Bar mill operations are down about 5 points to near 60 per cent. Mills report easing of pressure from buyers against prices. Soft steel bar prices, with plates and shapes, have drifted to a spread of $2 over Pittsburgh.

New York—While the minimum for steel bars is 1.65c, Pittsburgh, most business is moving at 1.70c and 1.75c Buying is slow. Forging quality bars to the automotive trade are moving below normal. General opinion is stocks are low. Resumption of tonnage buying would result in firming of prices, according to sellers. Common iron bars remain 1.65c to 1.70c, Pittsburgh.

Pittsburgh — Steel bar demand holds at the restricted rate of the past several weeks, with requirements of cold bar finishers further limited by light automotive operations. Orders are in small lots on which producers usually name 1.75c, Pittsburgh. Larger buyers, however, are obtaining 1.65c, although such orders still are in the minority.

Youngstown, O. — Quiet competition for steel bar business tends to softening of the market. While important makers are trying to hold to 1.75c, Pittsburgh, it is becoming more apparent that 1.70c can be done, and even 1.65c has been taken in some instances and under special circumstances. Most of today's tonnages are going at 1.75c and 1.70c, but sales do not include many large lots, it is conceded.

Cleveland—The inquiry rate for merchant steel bars is improving, some makers report, but this is not universal. As yet this has not been translated into actual increased bookings. These are looked for, however, in September. Some jobbers are evidencing some slight inclination to expand their stocks. A few outside mills still quote 1.75c, Pittsburgh; others 1.70c. Bars can be bought from local mills at 1.70c to 1.75c, Cleveland. Small orders from diversified industries are fairly frequent but constitute unsatisfactory rollings at best.

Philadelphia—Demand is slow for soft steel bars, fully 15 per cent under a year ago. Prices are unchanged from 1.65c to 1.70c, base, Pittsburgh, with differentials in certain cases involving special factors.

Cleveland Engineers Expand Society Headquarters

The Cleveland Engineering Society is making a 40 per cent increase in the size of its headquarters in Carnegie Hall, Cleveland. The changes involve new offices, larger lobby and industrial exhibit, and an auditorium seating about 300.

Facilities will be provided in the rooms for daily engineers' luncheons, and for dinners in connection with evening meetings. These alterations, which will be complete by Sept. 1, are in keeping with rapid growth to third in the United States.

Plates

Large Ship Requirements Feature Market in Eastern District —Prices Are Fairly Stable

PLATE PRICES, PAGE 79

New York—Plate business has improved. The Heat Transfer Products Co., subsidiary of the American Locomotive Co., Schenectady, N. Y., has booked a pipe line in New York requiring 1000 tons of plates. Two other pipe lines are slated for early action, one to be built in the Bronx requiring 1000 tons of plates, to come out this week, and another one for New York requiring 7500 to 8000 tons. The Ajax Pipe Line Inc. has placed 12 oil storage tanks with a western fabricator, requiring a total of 5000 tons of plates. Senior & Palmer are low bidders on caisson work at Fifty-ninth street, New York, requiring 750 tons of plates. Patrick McGovern Inc. is about to place 4000 tons of plates for tunnel work in New York. The Carnegie Steel Co. is expected to supply about 2500 tons of plates for the reconditioning of five Roosevelt liners for the Federal Shipbuilding Co. The general price continues 1.75c, base, Coatesville, Pa., subject to occasional exceptions. It is estimated that eastern plate mills are operating at 50 to 75 per cent of finishing capacity.

Pittsburgh—Plates buying is off moderately from the June rate but continues more active than bars. Barge work remains quiet although additional business is looked for shortly. Recent awards require 500 tons of plates and shapes. Plates generally are 1.70c, Pittsburgh, with 1.65c applied on attractive lots.

Cleveland—Boiler shops are taking more plates than in several weeks. Machine shops and machinery manufacturers also are more active. Large lots for tanks and pipe lines are lacking. An order was placed with a Pennsylvania mill for three plates, weighing 14 tons each, 32 feet long, 54 inches wide and 4½ inches thick, machined down to 3¾ inches. The order was placed by the American Shipbuilding Co., Lorain, O., for an Erie, Pa., manufacturer of rubber mat making machinery. Plates usually are 1.65c, Pittsburgh.

Chicago—Plates for pipe line work are helping to keep mill operations at about 80 per cent. About 1500 tons for oil tanks has been placed for the Southwest through fabricators in this district. Oil tank plates pending amount to about 12,000 tons. Freight car specifications have been completed. Mill quotations are settling to a $2 spread over Pittsburgh.

Philadelphia—Plate demand continues below the average of bookings of two weeks ago, but finishing operations at eastern mills are held at 50 to 75 per cent. The usual price continues 1.75c, base, Coatesville, Pa., with occasional sales at 1.70c, and differentials allowed on certain classes of business. Preliminary bids are being required on two United States liners requiring 28,00 to 30,000 tons of plates, shapes and bars each. Columbia Steamship Co. opened bids July 10 on three vessels requiring a substantial tonnage of plates.

Birmingham, Ala. — Plants engaged in tank manufacture are active, consuming a fair tonnage of plates. Birmingham Tank Works and

Chicago Bridge & Iron Works and others are shipping heavily, especially to oil companies.

Contracts Placed

2000 tons, six 55,000-barrel oil storage tanks, New England Terminal Co., Providence, R. I., to Youngstown Boiler & Tank Co., Youngstown, O.

598 tons, 42 and 54-inch welded steel pipe for Salyer Consolidated Mining Co., Eureka, Calif., to Western Pipe & Steel Co., San Francisco.

500 tons, plates and shapes, car float extension for Southern Pacific railroad, to American Bridge Co.

150 tons, storage tank for Pacific Molasses Co., Los Angeles, to Lacy Mfg. Co., Los Angeles.

Contracts Pending

137 tons, sheet piling, United States engineers office, San Francisco; bids received.

100 tons, four tanks for General Terminal Corp., Los Angeles. Bids being received.

Wheeling Machine Products Co., Wheeling, W. Va., is increasing capital from $250,000 to $500,000.

Bolt and Nut Prices

Pittsburgh, Cleveland, Birmingham and Chicago

Discounts are for legitimate jobbing or large consuming trade purchasing in full-case lots, and apply to lists of May 10, 1930.

CARRIAGE BOLTS

All sizes, cut thread .....73 off
Rolled thread ⅜ x 6 and smaller take 10 per cent lower list.
Eagle list .....73 off

MACHINE BOLTS

All sizes cut thread, lag screws, plow bolts, Nos. 1-2-3-7 heads, tap bolts, blank bolts, stud bolts without nuts ..... 73 off
Tire bolts .....60, 10 and 10 off
Stove bolts, 80, 10, 10, 5 off in pkgs.; 80, 10, 10, 5, 2½ off in bulk.
Rolled thread machine bolts, ⅜ x 6 and smaller take 10 per cent lower list.

NUTS

Semifinished .....73 off

***HEXAGON CAP SCREWS**

Milled .....80-10-5 off
Upset 1 in. diam. and smaller 85-10 off

***SQUARE HEAD SET SCREWS**

Milled .....85-5 off
Upset 1 in. diam. and smaller ....80-10-5 off

*Discounts dated Jan. 23, 1930.

Rivets

Struc. c.l., Pitts.-Cleve.	2.90c
Structural, c.l., Chicago	3.00c

**7/16-inch and smaller, Pitts. .....70, 10 and 5 off
Chi., Cleve. .....70 to 70,10 and 5 off

**Some makers quoting 70 off with freight allowed on 300 pounds or more.

Wrought Washers

Carloads, Pitts. dist.	$6.50 to $6.75 off
Carloads, Chicago dist.	6.70 to 6.80 off
Less carloads, Chi. dist.	6.50 to 6.75 off

Railroads

Action Deferred on Larger Car Inquiries—Lehigh & New England Seeks 300

TRACK MATERIAL PRICES, PAGE 79

Chicago—Prospects of secondary rail buying are not favorable. Indications are that perhaps two or three roads, usually the chief purchasers in the secondary movement, may add tonnage to their primary buying, but that sales will be much below recent years. Miscellaneous orders of spikes, bolts and tie plates have been ordered out by several roads, but this has amounted to little more than 1000 tons. Nothing new has developed in the Illinois Central inquiry for 2300 freight and miscellaneous cars. Car shop specifications have been virtually completed on pending work.

New York—Lehigh & New England is inquiring for 300 50-ton steel underframe box cars and five steel underframe caboose cars. About 200 cars have been placed during the past week, much of the work going to the railroad's own shops. Purchase of 2100 freight cars by the Illinois Central has been held up. Union Pacific and Erie inquiries are still pending. New York Central has closed 12 shops for 10 days, heavy repair units of the system being affected.

Pittsburgh—Norfolk & Western placed 3000 tons of bars, shapes and plates in this district for the 500 box cars which, as noted July 3 in STEEL, it will build at its own plants at Roanoke. This duplicates a similar order placed earlier in the year with its own shops. The same road closed bids July 14 on about 14,000 tie plates to accompany recent rail orders. Track bolts and spikes for the rails were placed a short time ago. New inquiry for cars and track materials is quiet although specifications for fastenings are fairly well maintained. Prices are steady throughout the list.

Birmingham, Ala.—Plant of Pullman Car & Mfg. Corp. at Bessemer, Ala., is still in operation but on limited production. Orders on the books are being gradually filled, with no new business. The Ensley, Ala., rail mill will hardly start up again until late August with some old business still on hand.

Philadelphia—Lack of railroad buying has been a noteworthy feature of the steel market for several months but all records were shattered last week when one of the largest railroads failed to buy a single pound of steel. It is expected, however, that August will witness the placing of usual annual rail tonnages by the Pennsylvania and Reading roads.

Car Orders Placed

Detroit Edison Co., five steel hoppers, 70 tons capacity, to American Car & Foundry Co.

Fruit Growers Express Co., 154 refrigerator cars, to own shops.

Minneapolis & St. Louis, 500 box cars, to General American Tank Car Corp., Chicago; William H. Bremmer, receiver, authorized by court order and interstate commerce commission to issue equipment notes in partial payment.

Missouri-Kansas-Texas, 25 caboose cars to own shops, Denison, Tex.

United States navy, bureau of supplies and accounts, two 50-ton box cars and two 50-ton steel underframe flat cars, to American Car & Foundry Co.

Western Fruit Express, 12 refrigerator cars, to own shops.

Locomotive Orders Placed

Aluminum Co. of America, one 10-wheel switching locomotive for service on Alton & Southern, to Baldwin Locomotive Woks, Philadelphia.

Salt Lake & Utah, one 60-ton electric freight locomotive with four 180-horsepower, 750-1500 volt slow-speed motors locomotive-type control, to Baldwin Locomotive Works, Philadelphia and Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

Car Orders Pending

Lehigh & New England, 300 50-ton steel underframe box cars and five steel underframe caboose cars.

Maine Central, five de luxe coaches and two de luxe passenger-baggage cars.

Solvay Process Co., 10 air dump cars.

Western Fruit Express, 100 steel underframes for refrigerator cars, making 200 now pending.

Youngstown Sheet & Tube Co., Youngstown, O., 10 70-ton flat cars.

Ships Implements by Water

An experiment in shipping farm implements by boat from East Chicago, Ind., to New York for export is being made by International Harvester Co., Chicago. Two motor ships, EMPIRE STATE and BUCKEYE STATE, supplied by Federal Motor Ships Inc., have been put in this service. These vessels travel the Great Lakes route to Buffalo and through the barge canal to New York harbor, where the goods are delivered ship-side without transfer from the time they leave port in the Chicago district.

Structural Shapes

Awards Total More Than 56,000 Tons—Highest Week Since Mid-May — Subways Lead—Bridges, Office Buildings Also Play Important Part — Inquiries Revived

STRUCTURAL SHAPE PRICES, PAGE 79

New York—With two subway lettings, 14,820 and 4350 tons, respectively, structural steel awards jumped sharply this week. New work also is heavier. While apparently scraping bottom, prices appear little, if any, firmer. Awards over 1000 tons each are more numerous. Many smaller lettings too are noted. An office building taking 4000 tons, an apartment 6500 tons and a pier 2200 tons were placed. Fredburn Construction Co. is low on the Brooklyn technical high school contract, 7800 tons. An addition to the telephone building on Walker street will take close to 13,500 tons, much more than at first expected.

Pittsburgh—Structural steel fabricators are well engaged figuring on new inquiry but hesitancy still is noted in closing. Specifications for plain material continue steady with the market 1.65c to 1.70c.

Buffalo—A fairly large structural tonnage will be required for the $5,000,000 terminal of the Nickel Plate and Erie railroads here, this being the largest order in early prospect. The downtown produce terminal of competing roads will be largely concrete. Small orders are increasing in number.

Cleveland—Structural shape specifications are fair. Awards are few. Hunkin-Conkey Construction Co., general contractor, here, awarded steel, 1400 tons for the headquarters building, Cleveland board of education, to Massillon Bridge & Structural Co., Massillon, O. Bids now are going in on Central-Lorain bridge, here, 11,700 tons, to close early in August. Shapes are 1.65c, Pittsburgh.

Boston—Award of 1380 tons for Western Union Telegraph Co. building here, was the largest tonnage placed in several weeks. Largest of the pending group, totaling about 900 tons, is the 490-ton postoffice at Lowell, Mass.

Chicago—Prospects appear brighter in the structural market than for some weeks. Including several revived projects, inquiry totals nearly 15,000 tons. A fair number of awards have been closed. One fabricator is booked almost to capacity for several months, but this is due in part to plant expansion work of a sister subsidiary. Revised bids are being asked for the 5000-ton Lane Technical high school in Chicago. The Roosevelt hotel project in Wichita, Kans., totaling 1000 tons, is being revived. The prices quoted for plain material in this market represent a spread of $2 a ton over Pittsburgh.

Birmingham, Ala.—Better conditions are noted in structural shape. Shops are to operate on 5-7-day week schedules. Industrial works in the main are placing tonnages and hotels and office buildings throughout the South offer prospects. Ingalls Iron Works Co. is fabricating steel for new sheet mill and other work of Tennessee Coal, Iron & Railroad Co. at Fairfield, Ala., 1200 tons.

Philadelphia—Plain shape demand continues fair, with a promise of good business ahead. Prices continue to show an easier tendency and the market on plain standard material now is quoted 1.60c to 1.70c, base, eastern mill, with differentials occasionally below that minimum on large lots.

Contracts Placed

14,820 tons, subway route 108, section 8, New York, to American Bridge Co.

4350 tons, subway route 106, section 7, Bronx, N. Y., to McClintic-Marshall Co., through Dimarco & Reimann, New York, general contractors.

4000 tons, 35-story store and office building, Pearl, John and Platt streets, New York, to Hedden Iron Contruction Co., New York; Shroder & Koppel Inc., general contractors.

3500 tons, 40-story office and store building, Madison avenue and Fortieth street, New York, to Taylor-Fichter Steel Construction Co., New York; Dwight P. Robinson & Co. general contractor.

2600 tons, north approach to Wabash avenue bridge, Chicago, to American Bridge Co., Chicago; Kettler-Elliott Co., general contractor.

2500 tons, travel and transportation building for Chicago world's fair, Grant park, Chicago, to American Bridge Co., Chicago; John Griffiths & Son Co., general contractor.

2265 tons, pier D, Terminal Warehouse Inc., Jersey City, N. J., to McClintic-Marshall Co.

2225 administration building, department of education, Philadelphia, to Bethlehem Steel Co., Bethlehem, Pa.

2000 tons, office and store building, Gold, Platt and John streets, New York, to unstated fabricator.

1600 tons, bridge over Trenton river, Detroit, to Duffin Iron Co., Chicago.

1500 tons, apartment, West End Avenue and Ninety-seventh street, New York, to Easton Structural Steel Co., Easton, Pa.

1400 tons, board of education headquarters building, Cleveland, to Massillon Bridge & Structural Co., Massillon, O., through Hunkin-Conkey Construction Co., Cleveland, general contractor.

1358 tons, building, Western Union Telegraph Co., Boston, to New England Structural Co., Boston.

1200 tons, sheet mill and other developments, Tennessee Coal, Iron & Railroad Co., Fairfield, Ala., to Ingalls Iron Works Co., Birmingham, Ala.

1000 tons, bridge over Red river, at Thackerville, Okla., to Missouri Valley Bridge & Iron Works, Leavenworth, Kans.

970 tons, theater, Astoria, Long Island, N. Y., to Bethlehem Fabricators Inc., Bethlehem, Pa.

850 tons, addition, federal building and postoffice, Richmond, Va., to American Bridge Co.; National Construction Co., Atlanta, Ga., general contractor.

700 tons, bridges, Nickel Plate railroad, Angola, N. Y., to American Bridge Co.

700 tons, highway bridge at Collinsville, Okla. to Illinois Steel Bridge Co., Jacksonville, Ill.

500 tons, store, S. S. Kresge Co., Waterbury, Conn., to Palmer Steel Co., Springfield, Mass.

500 tons, addition, Chevrolet plant, Tarrytown, N. Y., to R. C. Mahon Co., Detroit; Fred T. Ley & Co., general contractor.

500 tons, department store in Washington state, to Ingalls Iron Works Co., Birmingham, Ala.

425 tons, 3-story mercantile building, 163 West Twenty-ninth street, New York, to Easton Structural Steel Co., Easton, Pa.; Magoba Construction Co., general contractor.

420 tons, freight building, Baltimore & Ohio railroad, Cincinnati, to American Bridge Co.

400 tons, 4-story building, Christian Brothers institute, Bronx, N. Y., to Kues Bros. Iron Works, Bronx, N. Y.

400 tons, four bridges, Pittsburgh & West Virginia railroad, to McClintic-Marshall Co., Pittsburgh.

397 tons, Michigan state highway bridge, Bertrande, Mich., to McClintic-Marshall Co.

325 tons, bridge work for Toledo, Peoria & Western railroad, to American Bridge Co., Chicago.

300 tons, Masonic temple, Steuben-

Awards Compared

	Tons
Awards this week	56,757
Awards last week	27,885
Awards two weeks ago	22,740
Awards this week in 1929	34,457
Av. weekly awards, 1930	34,775
Av. weekly awards, 1929	42,213
Av. weekly awards, June	31,479
Tot. awards to date, 1929	1,218,423
Tot. awards to date, 1930	1,008,470

ville, O., to Levinson Steel Co., Pittsburgh.

300 tons, Northwestern Bell Telephone Co. building, Cedar Rapids, Iowa, to Worden-Allen Co., Chicago.

280 tons, 6-story garage, 241 West Twenty-sixth street, New York, to Hinkle Iron Co., New York.

240 tons, building, Commercial Pigment Co., Baltimore, to Bethlehem Steel Co., Bethlehem, Pa.; United Engineers & Constructors Inc., Philadelphia, general contractors.

200 tons, highway bridge, Fort Collins, Colo., to Kansas City Structural Steel Co., Kansas City, Mo.

200 tons, upper roadway approach, Queensboro bridge, New York, to American Bridge Co.; Arthur I. Kraft Inc., general contractor.

200 tons, building, Standard Oil Co., Baton Rouge, La., to Virginia Bridge & Iron Co., Birmingham, Ala.

200 tons, warehouse, Edgar T. Ward's Sons Co., Chicago, to unstated fabricator.

200 tons, restaurant, White Plains, N. Y., to Service Iron Works, Bronx, N. Y.; John H. French Co., general contractor.

190 tons, state highway bridge, Syracuse, N. Y., to Bethlehem Steel Co., Bethlehem, Pa.

175 tons, addition, Cleveland Heights, O., high school, to Kilroy Structural Steel Co., Cleveland.

150 tons, yarn mill, Clifton, N. J., to Robinson Iron & Steel Co., Philadelphia.

150 tons, legation building, Royal Norwegian Legation, Thirty-fourth street and Massachusetts avenue, Washington, to Dietrich Bros., Baltimore, through DeSibour Construction Co., Washington, general contractor; J. J. Whelan, Washington, architect.

132 tons, contact building, Merrimac Chemical Co., Medford, Mass., to New England Structural Co., Boston.

125 tons, seven subway rectifier stations, board of transportation, New York, to National Bridge Works, Long Island City, N. Y.; J. F. Murphy Co., general contractor.

110 tons, bridge, Baltimore & Ohio railroad, Gathersburg, Md., to Bethlehem Steel Co., Bethlehem, Pa.

100 tons, Dixie paper cup plant, Easton, Pa., to Shoemaker Bridge Co., Pottstown, Pa.

100 tons, bridge across Red river, between Gainesville, Tex., and Marietta, Okla., for Texas Highway commission, Austin, Tex., to Missouri Valley Bridge & Iron Co., St. Louis, at $320,817.

Contracts Pending

13,000 tons, addition, telephone building, Walker and Lispenard streets, New York.

11,700 tons, Central-Lorain bridge, Cleveland; bids close Aug. 6.

7800 tons, technical high school, Brooklyn, N. Y.; Fredburn Construction Co., New York, low on general contract.

5000 tons, Lane Technical high school, Chicago; revised bids asked.

4600 tons, apartment building, Chicago.

4000 tons, apartment hotel, Baltimore; bids in.

4000 tons, branch plant at Richmond, Calif., Ford Motor Co., Detroit.

2000 tons, branch plant at Long Beach, Calif., Proctor & Gamble Co., Cincinnati.

1800 tons, state building, Los Angeles; bids Aug. 5.

1750 tons, additional factory unit, Bakelike Corp., Bound Brook, N. J.

1500 tons, telephone building, Newark, N. J.

1300 tons, Central Bank building, Battle Creek, Mich.

1178 tons, New York state bridges; bids opened at Albany, N. Y., July 22.

1000 tons, 22-story office building, Seventh avenue and Thirty-seventh street, New York.

1000 tons, Roosevelt hotel, Wichita, Kans., revived.

1000 tons, building, Cincinnati Union Terminal Co., Cincinnati; bids in.

900 tons, bridge, Northampton county, Pa.; bids July 17.

900 tons, highway bridge over St. Croix river, Stillwater, Okla.

800 tons, addition, Equitable Life building, 293 Seventh avenue, New York.

800 tons, theater for Publix Theaters Corp., Chicago.

750 tons, Jerome hotel, Columbia, S. C.

700 tons, warehouse for Grocers' Wholesale Co., Des Moines, Iowa.

600 tons, addition to power house at Marysville, Mich., Detroit Edison Co., Detroit.

500 to 900 tons, Shaker Heights, O., high school; bids close July 19.

490 tons, post office, Lowell, Mass.

473 tons, subway on Broadway, Tucson, Ariz.; bids Aug. 4.

450 tons, group of food terminal buildings, Buffalo; George S. Rider Co., Cleveland, architect.

350 tons, Virginia Electric Power & City Gas Co., plant, Norfolk, Va.; general contract to W. W. Thompson Co., Norfolk.

200 tons, Charles river draw bridge, Boston.

175 tons, state highway bridge, Dudley, Mass.

168 tons, state bridge over Trinity river, California; bids received.

150 tons, school, San Francisco; Schraders Iron Works, San Francisco, low bidder.

105 tons, inlet building, State Water commission, Barre, Mass.

102 tons, outlet building, State Water commission, West Boylston, Mass.

100 tons, hotel, Reno, Nev.; bids being taken.

Concrete Bars

1100-Ton Job Let in Philadelphia—Other Awards in 100 to 300-ton Range Fairly Numerous — New Orleans Bought 500 Tons—Inquiry Rate Well Maintained

REINFORCING BAR PRICES, PAGE 79

New York—Small orders of reinforcing bars are more numerous. Prices on such are fairly firm. Shading continues, however, on larger tonnages, no two jobs going near alike. Some sellers are waiving extras for cutting mill lengths when such operations are not too involved. On small lots 2.45c, delivered New York, is noted on small orders.

Demand for mesh is about equal to last year. Roadwork is heavier but building mesh is lighter. Prices are inclined firmer.

Buffalo—Two new concrete inquiries, one for 266 tons and another for about 300 tons, are reported this week. Two other big projects, as yet unestimated, are in early prospect.

Pittsburgh—The reinforcing bar market in this district lacks large individual lots. A fair number of orders involving less than 100 tons at a time are being entered and incoming tonnage to producers holds at an active rate. The outlook remains fair. Prices generally are 2.00c, Pittsburgh for out length and 1.75c for stock lengths.

Chicago—Shipments of rail steel reinforcing bars remain under a year ago despite the heavy Illinois road programs. Billet reinforcing bar sales in June and July were ahead of last year. Billet bar makers are quoting a price of 1.85c for 500 tons and over.

Birmingham, Ala.—Business in concrete bars is picking up and several contracts were placed here recently, including 500 tons for New Orleans to Connors Steel Co.

Contracts Placed

1100 tons, headquarters building, Board of Education, Philadelphia, to Concrete Steel Co., Youngstown, O.

500 tons, work for New Orleans, to Connors Steel Co., Birmingham, Ala.

438 tons, paving work in San Mateo county, Calif., to unstated interest.

200 tons, grade crossing, Lehigh Valley railroad, Somerville, N. J., to Concrete Steel Co., Youngstown, O.

(*Concluded on Page* 87)

Awards Compared

	Tons
Awards this week	3,362
Awards last week	6,543
Awards two weeks ago	4,753
Awards this week in 1929	4,545
Average weekly awards, 1929	5,849
Average weekly awards, 1930	6,908
Average weekly awards, June	7,338
Total awards to date, 1929	184,195
Total awards to date, 1930	200,339

Strip

Mid-Season Dullness Holds Back Future Buying—Production Is at Low Point

STRIP PRICES, PAGE 79

New York—Strip buyers continue to hold off pending developments in consuming industries, notably automotive and accessory lines. Little contracting has been done for third quarter. Backlogs with most mills are small. Prices are unchanged on wide hot strip, 1.65c to 1.70c, Pittsburgh. Narrow widths are 1.75c to 1.80c, Pittsburgh. Cold rolled is 2.45c to 2.55c, Pittsburgh, the latter being noted on small lots.

Worcester, Mass.—The first week of July showed a decided upward trend in cold-rolled strip, orders placed locally and from the Pacific coast bringing production to 60 per cent of June output in one instance. Second week production, however, is back on the former basis, about 25 per cent of capacity. Prices are at 2.60c.

Pittsburgh—Strip producers are feeling the full effects of shutdowns at automotive plants and incoming business is insufficient to provide operations better than 40 per cent. Consumers' stocks are low and any upturn in operations is expected to be reflected shortly in steel demand but forward specifications so far have been light. Prices usually are holding at minimums of 1.65 and 1.75c for the two sizes of hot strip and 2.45c for cold-rolled strip.

Cleveland—Further attractive tonnages of wide and narrow hot strip steel were purchased last week. These orders carried 1.65c and 1.75c, Pittsburgh, respectively. Some cold rollers recently bought wide at 1.60c, but 1.65c seems to be minimum on cut-to-length material. Small orders for cold strip carry 2.45c, Cleveland.

Chicago—Slightly heavier orders are reported for hot-rolled strip in this market. Operations remain at about 50 per cent. The market is quoted generally at 1.90c, Chicago, for narrow sizes, and 1.80c for 6 to 24-inch materials. Cold-rolled strip mills have no backlogs.

Cold-Finished Bars Find Auto Demand Lowered

Cold Finished Prices, Page 79

Pittsburgh — Automotive requirements of cold-finished steel bars are at the lowest level in years and producers are forced to depend largely on other consuming industries for business. Demand from such industries reflects the general industrial quietness but is relatively more active than automotive buying. The market lacks the stimulus of large individual lots and producers are able to maintain the former 2.10c price.

Cleveland—Small orders continue to rule in cold-finished bars. Needs are restricted because of the lowered consuming rates among automotive customers. While some buyers claim they can purchase at less than 2.10c, that is the quotation named here.

Refractories Are in Small Demand in Dull Period

Refractories Prices, Page 90

Pittsburgh—Sales of refractories are light, business recently declining to the lowest level of the year and below a year ago. New construction work is quiet among iron and steel plants and demand for repair purposes has been only moderate. Several blast furnace relinings and stove work are in prospect for the Carnegie and Bethlehem Steel companies. Brick producers are maintaining quotations at former levels despite pressure on the part of buyers for concessions. First quality fire clay and silica brick are quoted $43, with magnesite brick continuing $65. Chrome brick is $45.

Bolt and Nut Demand Is Below Month Ago

Nut and Bolt Prices, Page 81

Pittsburgh—Bolt, nut and rivet demand is steady but light. Tonnage is off moderately from that a month ago. Operations continue about 50 per cent. Prices are steady at 73 off for bolts and nuts and 2.90c, Pittsburgh, for large rivets.

Cleveland—Orders for nuts, bolts and rivets still are scarce, in harmony with restricted needs during the present lull. A pickup is expected in August. Quoted price levels are held.

Chicago—Producers of bolts, nuts and rivets are resuming operations again after shutdowns for inventories, but schedules are on a reduced rate. Occasional spurts in orders have developed but buying is not well sustained. Quotations for rivets are unchanged at 3.00c, Chicago.

Iron Ore Shipments Are Being Deferred

Iron Ore Prices, Page 90

Cleveland—Deferments continue to be received by Lake Superior iron ore shippers. Supplies on hand exceed current demand. One producer sold 20,000 tons. The usual run of small orders, however, is lacking, and not much of this class of business is expected until fall. Stocks on Lake Erie docks July 1 were 530,238 tons larger than those of the same period last year, as shown by the following report of receipts and shipments for the season from the Lake Superior Iron Ore association:

Port	Receipts	Shipments	Dock Balance July 1, 1930
Buffalo	925,067	91,347	1,694
Erie	165,307	224,686	64,648
Conneaut	2,333,797	2,478,119	1,451,189
Ashtabula	1,813,550	1,978,453	1,353,540
Fairport	585,174	617,434	317,348
Cleveland	2,320,011	1,686,011	958,717
Lorain	740,747	277,209	118,521
Huron	458,630	491,970	321,796
Toledo	409,514	277,026	25,185
Total	9,751,797	8,122,255	4,612,638
Comparative 1 yr. ago	14,928,976	11,793,868	4,082,400

Receipts to July 1 at other ports follow:

Port	Tons
Detroit	232,548
Indiana Harbor	855,184
Gary	1,353,235
South Chicago	2,107,016
Sault Ste. Marie, Ont.	127,270
Point Edward, Ont.	122,105
Total	4,797,358
Comparative 1 year ago	5,718,714

Mining School Publishes Current Bulletin

Courses of study available and the schedule for the year 1930-31 of the Michigan College of Mining and Technology, Houghton, Mich., has been published in the current *Bulletin* of the college. The institution offers complete courses in civil, electrical, mechanical, and mining engineering while special emphasis is laid on all phases of metallurgy and mining work.

Concrete Awards

(*Concluded from Page* 83)

200 tons, school, Wisconsin Rapids, Wis., to American System of Reinforcing, Chicago.
200 tons, post office, Flint, Mich., to Olney J. Dean Co., Chicago.
150 tons, bridge across Red river, between Gainesville, Tex., and Marietta, Okla., for Texas Highway commission, Austin, Tex., to Missouri Valley Bridge & Iron Co., St. Louis, at $320,817.
140 tons, road surfacing, Kane county, Illinois, to Concrete Engineering Co., Omaha, Nebr.
134 tons, bridge over Klamath river, Siskiyou county, Calif., to unstated interest.
100 tons, fire wall, General Petroleum Co.'s plant, Seattle, and gymnasium, Lakeside school, Seattle, to Northwest Steel Rolling Mills, Seattle.
100 tons, hospital, Southern Pacific railroad, El Paso, Tex., to unstated interest.
100 tons, coke plant, Philadelphia Coke Co., Philadelphia, to Truscon Steel Co., Youngstown, O., through Rust Engineering Co., Pittsburgh.

Contracts Pending

300 tons, plant foundations, Ford Motor Co., Buffalo; Great Lakes Dredge & Dock Co., Buffalo, general contractors.
277 tons, Broadway subway, Tucson, Ariz.; bids Aug. 4.
275 tons, paving work in Yuba City, Calif.; bids received.
268 tons, two viaducts in Forest Park, St. Louis, board of public service, City Hall, St. Louis.
266 tons, bridge over Eighteen Mile creek, Buffalo; bids July 22.
200 tons, hospital, Springfield, Mass.
200 tons, warehouse in Los Angeles; bids being received.
160 tons, bridge, Connelly avenue, Jersey City, N. J.; bids in on general contract.
150 tons, pier, Pennsylvania railroad, Jersey City, N. J.; Terminal Development Co., general contractor.

Semifinished Steel Demand More Restricted

Semifinished Prices, Page 90

Pittsburgh—Practically all grades of semifinished steel continue in a quiet market. New business consists mainly of small spot tonnages while specifications against contracts also are light. Prices usually are $31 for rerolling billets, sheet bars and slabs, with forging material taking a $5 preferential, and wire rods at $36.

Chicago—Sale of semifinished steel is extremely light. Shipments have been much reduced since the early part of the month. In the absence of active buying, quotations for billets, blooms and slabs are nominal on the basis of $32, Chicago. Sheet bars are unchanged at $32. Wire rods are $37, Chicago.

Pipe

Milwaukee Buying 6675 Tons of Cast—New York and Michigan Active—Line Pipe Deferred

PIPE PRICES, PAGE 101

New York—While there has been a decline in cast pipe buying the past two weeks, most eastern and southern foundries have fair backlogs. The industry is operating over 70 per cent. Prices are firm, even on small lots which are fairly numerous. Little business is moving under $37, eastern foundry. Bids were opened this week on three contracts for New York city borough water installations.

Barnsdall Corp., and Continental Oil Co., announce plans for a 1400-mile gasoline pipe line to cost $12,000,000. The main line, 8-inch will run from Barnsdall, Okla., to Des Moines, Iowa, with branch lines, 4-inch, to Chicago, St. Paul, Minneapolis, Council Bluffs, Iowa, and Omaha, Nebr. A 4-inch line also will be installed from Chicago to Milwaukee, and is to be operated by Great Lakes Pipe Line Co.

Boston—More than 600 tons of cast pipe was awarded last week in the New England section. R. D. Wood & Co. was awarded 250 tons for Wethersfield, Conn., and 385 tons for Hartford, Conn.

Pittsburgh—New business in tubular products remains fairly quiet with little additional line pipe tonnage developing. It is understood that the placing of some lines, recently active, may be postponed in part until next year due to difficulty in obtaining early shipment. Standard pipe business holds at its recent slow rate and continues less active than a year ago. Oil country goods demand still is spotty but this business is close to the 1929 rate. Mechanical tubing demand is light, with automotive requirements dull. Locomotive and boiler tubes also are in light demand. Pipe mill operations hold at 75 per cent.

Chicago—A moderate pickup in municipal inquiry and sales and a sprinkling of contract business continues to furnish the cast pressure pipe market with a fair volume of orders. The 2000 tons of 4 to 16-inch cast pipe for Garden City, Mich., waterworks has been re-figured by sellers. Rogers City, Mich., will buy 1000 tons of 6 to 12-inch cast pipe. Chicago delivered prices are on the basis of $45.20 to $46.20.

Birmingham, Ala.—Shipments of cast pipe are active but new business is coming in slowly.

Contracts Placed

750 tons, 12 to 24-inch cast pipe for Richmond, N. Y., to Warren Foundry & Pipe Co., Phillipsburg, N. J.; reported last week as going to unstated foundry.
501 tons, 16-inch sand cast pipe for Olympia, Wash., to French interests, through Pacific Water Works Supply Co., Seattle.
385 tons, various sizes, cast pipe for Hartford, Conn., to R. D. Wood & Co., Florence, N. J.
300 tons, sand cast pipe for improvements Eleventh avenue and Thirty-fifth avenue, S. W., Seattle, to American Cast Iron Pipe Co., Seattle.
280 tons, 8, 10 and 12-inch cast pipe for Morristown, N. J., to United States Pipe & Foundry Co., East Burlington, N. J.
265 tons, 12 and 16-inch class B cast pipe for San Francisco, to United States Pipe & Foundry Co., East Burlinton, N. J.
250 tons, various sizes, cast pipe for Wethersfield, Conn., to R. D. Wood & Co., Florence, N. J.
100 tons, 12-inch cast pipe for Bronx, N. Y., to United States Pipe & Foundry Co., East Burlington, N. J.
Unstated tonnage, 1700 lineal feet of 6-inch class C water mains for Park Falls, Wis., to Crane Co., Chicago; $49 per ton.

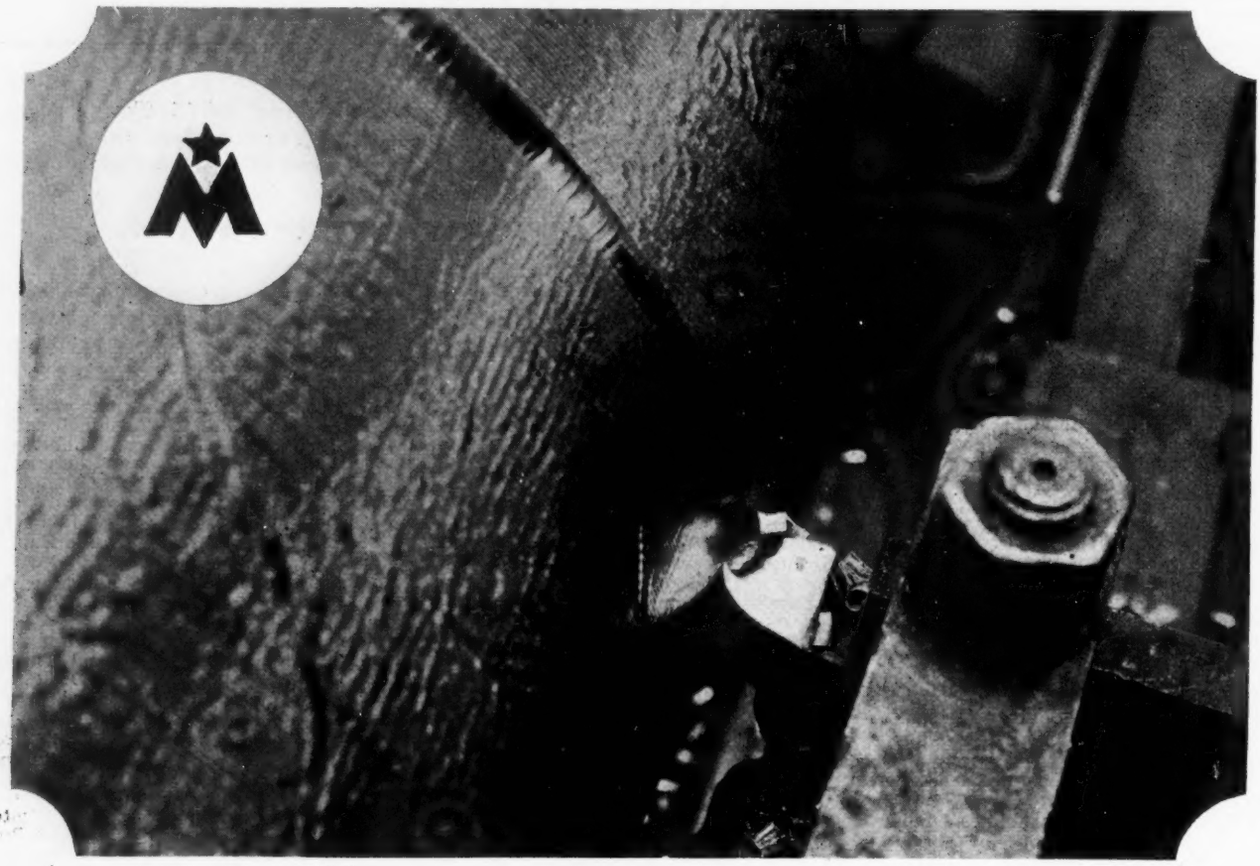
Contracts Pending

6247¼ tons, 54-inch class C plain cast pipe for Milwaukee; also 100 tons, 20-inch class C plain; 225.36 tons, 54-inch class C lugged; and 207.824 tons 20, 30, 36 and 54-inch special castings; bids close July 22.
2000 tons, 4 to 16-inch cast pipe for Garden City, Mich., waterworks; refigured.
1000 tons, 6, 8 and 12-inch cast pipe for Rogers City, Mich.
771 tons, 6 and 8-inch class 150 cast pipe for San Francisco; bids July 21.
600 tons, 6, 8 and 16-inch cast pipe for Putnam, Conn.; Donaldson Iron Co., Emaus, Pa., low.
600 tons, 10-inch cast pipe for Braintress, Mass.; bids opened July 18.
500 tons, 6 and 8-inch cast pipe for Jackson, Mich.
260 tons, 6 and 10-inch class 150 and 250 cast pipe for San Francisco; bids July 14.
140 tons, 4 to 8-inch class 150, Eureka, Calif.; bids July 15.
Unstated tonnage, 2750 feet of 8-inch and 1317 feet of 6-inch cast pipe for Hammonton, N. J.; bids July 24.

Tin Plate Specifications Light; Output Lower

Tin Plate Prices, Page 79

Pittsburgh—Tin plate activity remains fair, aided by the receipt of



HEAVY HOGGING ALLOY STEELS

Hogging tough alloy forgings is a most severe test for tool steel . . . and this test is given Midvale High Speed Tool Steels every day in the eight machine shops at our Nicetown Plant. Above, the tool can be seen taking a heavy roughing cut over a 22% chrome, 10% nickel steel forging . . . the meanest, toughest kind of steel likely to be encountered by the average machine shop.

Midvale High Speed Tool Steel is a product of the electric furnace . . . a uniform steel free from all impurities. Its uniformity and the ease with which it can be forged makes it ideal for lathe, planer, boring mill and shaper use. It makes possible heavy cuts and feeds at high speeds with a minimum number of regrinds and broken tools.

Complete stocks of high speed tool, carbon and special purpose alloy steels are maintained in all our warehouses; write or wire The Midvale Company, Nicetown, Philadelphia, or one of our district offices, located in New York, Pittsburgh, Washington, Cleveland, Chicago and San Francisco.

MIDVALE

supplementary tonnage resulting from revised estimates of requirements for the pea pack. A few specifications for September shipment which are scheduled to be on hand by July 15 have been received, but as usual they are considerably lighter than during the active summer months. Considerable tin plate tonnage for leading vegetable packs remains to be shipped but with some of this already produced mill operations are expected to show no improvement over the next month. Production currently is lower at 70 per cent. The general market is $5.25 per base box.

Operations Ease Off at Important Centers

Chicago—Steelworks blast furnace production again has been reduced through the blowing out of No. 1 furnace at Gary, by Illinois Steel Co., leaving 18 of the 36 steelworks stacks in the district blowing. Three furnaces are banked at Gary. Ingot output is about 60 per cent. Rail mill operations have dropped a few points to about 50 per cent.

Pittsburgh—Steelmaking operations are slightly lower at 60 per cent. Schedules of most finishing mills are unchanged although tin plate is lower at 70 and strip is down to 40. Sheet production continues 50, with pipe at 75.

Cleveland—Steelmaking is increased for the second week, following the previous consecutive six-week decline. Seventeen of 34 open hearths are on and production represents a 50 per cent rate.

Buffalo—Steelworks have established a quick gain from the low point of the early month. Open-hearth operation today represents 54 per cent, compared with the previous 48. One mill at Lackawanna has been placed on double turn, the others there and elsewhere being on single turn.

Youngstown, O.—Mill operations continue to scrape bottom with a general average about 60 per cent. Independents report an increased interest by consumers evidenced in more inquiries. Independent steel production embraces 28 of the 51 open-hearth furnaces and 60 per cent bessemer output. Steel tonnage is largely used in supplying pipe mills. Corporation operations are reported between 55 and 66 per cent. Of the 120 independent sheet mills 47 will operate during the week. Strip mill operations are not above 55 per cent due to suspension of activity in the automotive industry.

Wire

Prices Resist Decline but Some Shading Is Seen in Nails—Demand Is Slow, in Small Lots

WIRE PRICES, PAGE 79

Chicago—Sales of manufacturers' wire are decidedly discouraging. Hopes of heavier steel electrical wire demand this year are disappearing. Western wire mill operations are under 50 per cent. Buyers press for every advantage apparent in price. For wire nails, $2.15 to $2.20, Chicago or western mills, is being named more generally as a jobber range. Annealed fence wire remains at 2.35c to 2.45c, Chicago or western mills.

Worcester, Mass.—With miscellaneous lines showing strength but regular lines off, wire production remains at about 50 per cent of capacity. Demand from automtive users is soft. Plain bright wire to dealers is holding at 2.40c, base, Worcester.

New York—Plain wire is fairly firm at $2.30, Pittsburgh. Prices on plain wire are better maintained than on other wire products. Some shading continues on nails. Volume is light. Most rail business is going at $2.10 on medium and small lots. On carload lots $2.05, Pittsburgh, is reported. Little business is now being done at $2.15.

Philadelphia—Plain steel wire is firm here at 2.30c, base, Pittsburgh, and nails at $2.05 to $2.10, Pittsburgh.

Pittsburgh—Wire business holds to its recent slow pace. A few forward specifications have been received for automotive interests although most current orders represent immediate requirements. Jobbers have restricted stocks materially and are seeking prompt shipments. The price remains firm in the Pittsburgh district with nails at $2.15. Prices in other districts, however, are admitted to be unsettled. Plain wire is steady at 2.30c, with wire rods $36.

Cleveland—No interest is being developed in wire products. In the absence of business, quotations are nominal, 2.30c, Cleveland, on plain wire and $2.15, Cleveland, on nails. Some mills state they would go to $2.10 for two or three cars.

Warehouse Sales Sluggish in Summer's Dullness

Warehouse Prices, Page 101

Pittsburgh—Business has moderated only slightly but is slower than a month ago. Orders are in about their former number but tonnage is smaller. Prices on heavy products are unchanged, with shading still noted.

Boston—A generally slower situation prevailed for warehouses in the past week, very few lines having any call at all. Selling was for small tonnages.

New York—Recent reductions in several warehouse items have failed to stimulate buying. Volume is about the same as June with no outstanding demand.

Philadelphia—Jobbers say orders equal June's rate which was slightly above May's.

Buffalo—Orders are small and volumes not as brisk as some sellers had anticipated for the quarter. Demand is without special feature.

Cleveland—Buying generally is closely following the quiet tenor of recent weeks. Bar demand is reported up slightly, while sheets and strip have slipped a notch.

Detroit—July's volume will be less than in June and probably the low mark of the year, as a pickup is confidently expected in the last half. Many heavy takers have closed plants during July.

Chicago—Warehouses are experiencing a dull month. Reinforcing bars and light shapes are moving fairly well, but all bar products are much below a year ago.

Cincinnati—Tonnage is being held low while individual orders continue small. Quotations are unchanged.

St. Louis—Oil field demand is off and the revival expected after the holiday failed to materialize. Road building materials and concrete bars are the most active.

Trackwork Total Lower

Production of trackwork for rail track of 60 pounds per yard or heavier in June totaled 10,553 net tons, according to statistics of the American Iron and Steel institute. This compares with 12,779 tons in May and 14,838 tons in June, 1929. For second quarter of 1930 the total was 36,860 tons, compared with 37,450 tons in first quarter and 47,986 tons in second quarter of 1929.

Raw Material Prices

Pig Iron

Per Gross Ton

FOUNDRY NO. 2

Chicago, furnace	$18.00
Pittsburgh, district fur.	18.50
Pittsburgh, delivered	19.13 to 19.63
Valley, furnace	18.00
Cleveland fur., local del.	18.00
Philadelphia, delivered	19.76
Virginia, furnace	17.75
Granite City, Ill., fur.	18.50 to 19.00
Buffalo, fur., local del.	18.50
Buffalo, del. Boston	21.41 to 21.91
Buff., all-rail Brooklyn	20.91 to 21.41
Buff., all-rail, Newark	19.28 to 19.78
Ala., Bir. fur., local del.	14.00
Alabama, del. Chicago	18.01
Alabama, del. St. Louis	17.42
Alabama, del. Cincinnati	16.69 to 18.19
Alabama, del. Cleveland	18.51 to 19.01
Ala., Phila., dock del.	17.25 to 18.25
Ala., Balt., dock del.	17.00 to 18.00
Alabama, New York dock	18.00 to 18.50
Ala., Boston dock del.	20.21
Tenn., Bir. base, local del	14.00
Tennessee, del. Cin.	16.69 to 18.19
Montreal, delivered	23.50
Toronto, delivered	22.10

FOUNDRY, NO. 2X

Buffalo, fur., local del.	19.00
Buff., all-rail, Brooklyn	21.41 to 21.91
Buffalo, all-rail, Newark	19.78 to 20.28
Buffalo, del. Boston	21.91 to 22.41
Virginia furnace	18.25
Eastern, del., Phila.	20.26

FOUNDRY, NO. 1X

Buffalo fur., local del.	20.00
Eastern, del., Phila.	20.76

MALLEABLE

Chicago, furnace	18.00
Cleveland fur., local del.	18.00
Pittsburgh district fur.	19.00
Pittsburgh, delivered	19.63 to 20.13
Valley furnace	18.50
Buffalo fur., local del.	19.00
Eastern Penn., delivered	19.76 to 21.41
Granite City, Ill., fur.	18.50 to 19.00
Montreal, delivered	24.00
Toronto, delivered	22.60

BASIC

Pittsburgh dist. fur.	18.50
Pittsburgh, delivered	19.13 to 19.63
Eastern Penn., del.	18.00 to 18.50
Buffalo fur., local del.	18.00
Montreal, delivered	22.50
Valley furnace	18.00

BESSEMER

Valley furnace	18.50
Pittsburgh, delivered	20.26

LOW PHOS

Valley fur., standard	27.00
Philadelphia, standard	24.26 to 24.76
Furnace, copper-bearing	23.00 to 23.50

GRAY FORGE

Pittsburgh district fur.	18.00
Pittsburgh, delivered	18.63 to 19.13

CHARCOAL

Lake Superior, del. Chicago	27.04

SILVERY

Jackson County, O., fur., in per cents 5—$21.50; 6—$21.50; 7—$22.00; 8—$22.50 to $23.00; 9—$23.00 to $24.00; 10—$23.50 to $27.00; 11—$24.50 to $28.00; 12—$25.50 to $30.00; 13—$26.50 to $32.00.

BESSEMER FERROSILICON

Jackson County, O., fur., in per cents 10—$29; 11—$31; 12—$33; 13—$35; 14—$37; 15—$39; 16—$42; 17—$45.

Coke

Prices Per Net Tons

Beehive Ovens

Connellsville furnace	$2.50
Connellsville foundry	3.50 to 4.85
New River foundry	6.00
Wise county foundry	4.25 to 5.00
Wise county furnace	3.50 to 4.25

By-Product Foundry

Newark, N. J., del.	$9.00 to 9.40
Chicago ovens	8.00
New England, del.	11.00
St. Louis, del.	9.00
Birmingham, ovens	5.00
Indianapolis, del.	8.25
Ashland, Ky., ov., Connell. basis	6.50
Portsmouth, O., ov., Connell. basis	6.50
Buffalo ovens	8.75
Detroit ovens	8.50
Philadelphia, del.	9.00

Iron Ore

LAKE SUPERIOR ORE

Gross Ton, 51½%, Lower Lake Ports

Old range	$4.80
Mesabi	4.65
Old range	4.65
Mesabi nonbessemer	4.50
High phosphorus	4.40

EASTERN LOCAL ORES

Cents per unit delivered at Eastern Pennsylvania and New Jersey furnaces

Foundry and basic, 56-63%, contract	10.00
Copper-free low phos.	58.65% nom.

FOREIGN ORE

Cents per units, alongside docks Atlantic ports

Foreign manganiferous ore, 45-55% iron, 6-10% manganese	10.50 to 11.00
North African low phosphorus	10.50
Swedish basic, 65%	9.50 to 10.50
Swedish low phos.	11.00
Spanish, North African basic, 50 to 60%	9.50 to 10.00
Newfoundland fdy., 55%	9.00
Tungsten, spot and future, short ton unit, duty paid	12.00 to 12.50
Chrome ore, 48%, net ton c.i.f.	$21.50 to 22.50

Manganese Ore

Prices, not including duty, are cents per unit; cargo lots.

Caucasian, 52-55%	30 cents
Indian, 48-50%	30 cents
Brazilian, 46-48%	28 cents

Refractories

FIRE CLAY BRICK

Per 1000 f.o.b. Works

First Quality

Pennsylvania, Ohio, Illinois, Kentucky, Missouri, Maryland	$43.00
Georgia, Alabama	40.00 to 47.00

Second Quality

Pennsylvania, Ohio, Illinois Kentucky, Missouri, Maryland	35.00 to 38.00
Georgia, Alabama	30.00 to 35.00

SILICA BRICK

Pennsylvania	43.00
Joliet, Ill., East Chicago, Ind.	52.00
Birmingham, Ala.	50.00 to 51.00

MAGNESITE BRICK

Per net ton

9 x 4½ x 2½	65.00

MAGNESITE

Dead burned grain, net ton, Chester, Pa., or Baltimore base	40.00
Domes, Chewelah, Wash., base	22.00

CHROME BRICK

Net ton, Chester, Pa., and Baltimore base, 9 x 4½ x 2½ | 45.00

Semifinished Steel

Prices Per Gross Ton

BILLETS AND BLOOMS

4 x 4-inch base

Pittsburgh, open-hearth	$31.00
Pittsburgh, bessemer	31.00
Youngstown	31.00
Cleveland	31.00
Philadelphia	37.30
Chicago	32.00
Forging, Chicago	37.00
Forging, Pittsburgh	36.00 to 37.00
Forging, Philadelphia	42.30

SHEET BARS

Pittsburgh	$31.00
Youngstown	31.00
Cleveland	31.00
Chicago	32.00

SLABS

Pittsburgh	$31.00
Youngstown	31.00
Cleveland	31.00

WIRE RODS

Pittsburgh, Cleveland	$36.00
Chicago	37.00

SKELP

All grades, Pittsburgh	1.70c to 1.75c

Ferroalloys

(In dollars, except Ferrochrome)

*Ferromanganese, 78-82%, tidewater, duty paid	$99.00
*Ferromanganese, del. Pittsburgh	103.79
Spiegeleisen, 19-21%, domestic fur. spot†	34.00
*Ferrosilicon, 50 per cent, freight all., c. l.	83.50
*Do, less carload	88.50
Do, 75 per cent	13.00 to 15.00
Ferrochrome, 66-70 chromium, 4-6 carbon. cts. lb., con., del.	11.00
Do, for spot delivery	11.50
Ferrotungsten, stand., lb. cont.	1.15 to 1.20
Ferrovanadium, 30-40 per cent, per lb., contained, on analysis	3.15 to 3.65
Ferro-carbon-titanium carload producers' plants, net ton	160.00
Do, one ton to c. l.	170.00
Ferrophosphorus, per ton, carload 17-19 per cent, Rockdale, Tenn., basis (18 per cent)	91.00
Ferrophosphorus, electrolytic per ton, carload, 23-25% f.o.b. Anniston, Ala., 24%	122.50

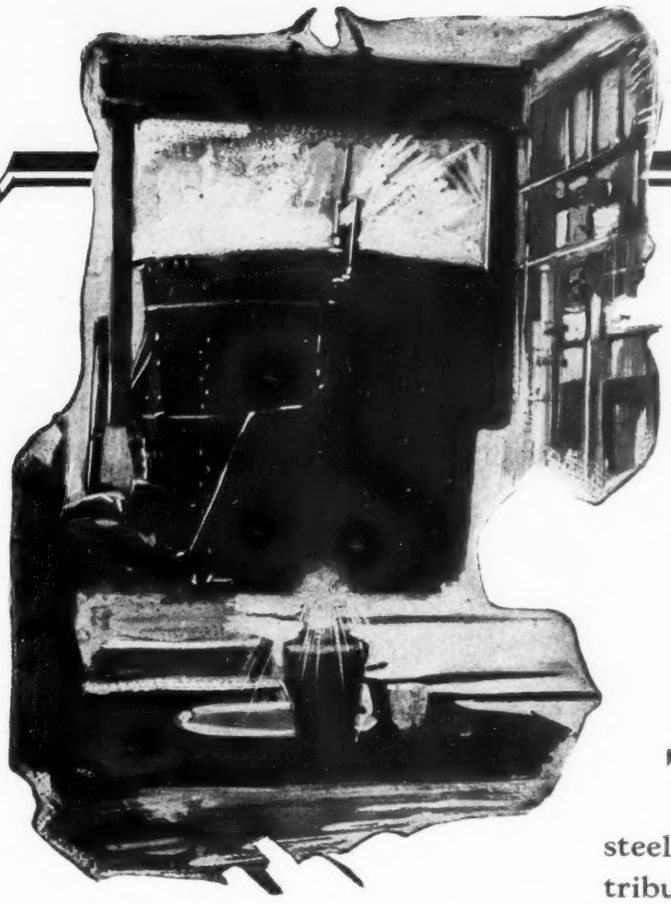
†Carloads. Differentials apply to large quantities.

*To users of carloads to 500 tons annually. Differentials apply to users of larger quantities.

Fluorspar

85 and 5 per cent grade

Washed gravel Kentucky and Illinois mines, per net ton	$18.00
Washed gravel, import duty paid east. tide., gross ton	19.50 to 20.50



Our Contribution

THE steel manufacturer has as his one aim the production of steel which is dependable. Our contribution to this quality product is to furnish ferro alloys that may be depended upon for uniformity of analysis and freedom from objectionable impurities.

We also maintain a staff of practical metallurgists whose wide experience enables them to assist in solving the special problems encountered by users of Electromet Ferro Alloys.

CHROMIUM
- High Carbon Ferrochrome (maximum 6% carbon)
- Low Carbon Ferrochrome (in grades, maximum 0.06% to maximum 2.00% carbon)
- Chromium Metal
- Chromium-Copper
- Miscellaneous Chromium Alloys

MANGANESE
- Standard Ferromanganese 78 to 82%
- Low Carbon Ferromanganese
- Medium Carbon Ferromanganese
- Manganese Metal
- Silico-Manganese
- Manganese-Copper
- Miscellaneous Manganese Alloys

SILICON
- Ferrosilicon 15%
- Ferrosilicon 50%
- Ferrosilicon 75%
- Ferrosilicon 80 to 85%
- Ferrosilicon 90 to 95%
- Refined Silicon (minimum 97% silicon)
- Calcium-Silicon
- Calcium-Manganese-Silicon
- Calcium-Aluminum-Silicon
- Silicon-Copper
- Silico-Manganese
- Miscellaneous Silicon Alloys

VANADIUM
- All Grades

ZIRCONIUM
- Silicon-Zirconium
- Zirconium-Ferrosilicon

Electromet
Ferro-Alloys & Metals

Sole Distributors

ELECTRO METALLURGICAL SALES CORPORATION

Unit of Union Carbide UCC *and Carbon Corporation*

Carbide and Carbon Building: 30 East 42d St., New York

Pig Iron

July Marking Low Point of Market Activity—Chicago Sales Increase

PIG IRON PRICES, PAGE 90

Pittsburgh—Activity in the pig iron market has not increased materially as a result of the recent reduction of 50 cents a ton in prices. Demand is restricted to small spot purchases, with little inquiry appearing for future needs. New business and shipments are lower this month than in June. Westinghouse Electric & Mfg. Co. has closed for an unstated tonnage for Trafford City, Pa., at prices understood to be in line with current quotations. No. 2 foundry and basic are $18, valley, and malleable and bessemer $18.50.

Boston—The melt in New England is estimated at 30 per cent of capacity, hence deliveries are light. Approximately 2000 tons of iron was sold in the past week, the Mystic Iron Works, Everett, Mass., booking 1300 tons. Furnace interests do not expect improvement by September.

New York—The Thatcher Furnace Co.'s inquiry for 2000 tons of No. 2 foundry iron for Garwood, N. J., has not been closed and competition for the order is keen. The Eastern Malleable Iron Co., Naugatuck, Conn., is inquiring for an indefinite tonnage of malleable. The General Electric Co. still is negotiating for about 2000 tons of iron for its various plants. Foundry iron is equivalent to $16, base, Buffalo, but the tone is easy and occasionally silicon differentials are waived. A number of small lots of southern iron have been sold here at $12.50 to $13, base, Birmingham, equivalent to $18 to $18.50, delivered on docks. Malleable is $16 to $16.50, Buffalo. The blast furnace of Witherbee Sherman & Co., Port Henry, N. Y., which was blown out July 2 is expected to resume in about three months. An eastern Pennsylvania furnace now idle may be placed in blast in the early fall.

Buffalo—The banking of two more furnaces, one at Donner and one at Hanna, has reduced the total number of active stacks to eight, the smallest in years. It is claimed $16, base, furnace, is minimum for eastern orders, and that $18.50 is firm in this district.

Cleveland—Furnace interests expect July will mark the bottom of the pig iron market in prices and deliveries. That shipments this month will be the lightest of any period so far this year is now evident. Consumption has diminished considerably, especially in the automotive industry. Improvement, however, is noted in inquiries from eastern districts. Some large consumers while not actively in the market are asking for prices with a view to purchasing later this month. The most important inquiry is for 1000 tons of foundry iron for a northeastern Ohio melter. Furnace interests with headquarters in Cleveland booked 15,500 tons the past week, compared with 13,000 tons the week before. Small, spot orders predominate. A few sales were made in Cleveland at $18, base, furnace. While $17.50, base, furnace is the usual price for outside shipment, competition is keener and lower figures are reported. In western Ohio and Indiana the price has eased 50 cents to $17.50 to $18.

Youngstown, O.—Little new pig iron business is being done by merchant furnaces in this district. No. 2 foundry and basic are held at $18.50, furnace by some makers, while others are willing to accept $18. Bessemer and malleable are $18.50 to $19.

Cincinnati—One order for 500 tons of northern iron for an eastern Ohio melter and spot orders accounted for about 2000 tons in the past week. On sales of 100 tons or more of southern iron middle interests quote $12.50, base, Birmingham, a cut of 50 cents from the quotations in effect since early in the year. Peninsular Stove Co., Detroit, is in the market for 1000 tons of foundry iron.

Chicago—Sales of northern pig iron in the past week were the heaviest in more than two months. Orders included 500 tons of basic iron. One or two important inquiries are pending. While some views are that prices have reached bottom, reports are heard of concessions under the present market. The base quotation of $18, Chicago furnace, applies on a fair amount of going business. Furnace output is idling, with five merchant stacks on reduced operations. Offers are out for another cargo of boat iron. About 8000 tons now is on the dock in the Chicago district.

A cargo of silvery iron is expected in this district shortly, on consignment for an eastern furnace.

St. Louis—The market is quiet, sales in the past week amounting only to 2400 tons, for July and August delivery. The daily average rate of shipments is lower than at any time heretofore this year. Quotations are unchanged but keen competition gives liberal concessions.

Philadelphia—Eastern pipe plants have purchased at least 12,000 tons of foundry iron from eastern furnaces. Other business is small. Eastern Pennsylvania foundry iron continues $19, base, furnace, subject to equalizing freights, and the tone of the market is weak.

Birmingham, Ala.—Furnace interests here continue to sell small lots for delivery to Atlantic coast points and to the Chicago and St. Louis districts. A few contracts have been booked covering the third quarter. Production of foundry pig iron is steady, but the output of basic has been reduced. Prices are unchanged.

Toronto, Ont.—Pig iron sales are at a minimum, melters buying only enough to keep going at the reduced rate of operations. No forward delivery business was closed during the week, and spot sales amounted to less than 1000 tons. Prices are steady.

Spiegeleisen Price Is Reduced $1 Per Ton

Ferroalloy Prices, Page 90

New York—Spiegeleisen was reduced $1 a ton, effective July 15, the 19 to 21 per cent grade being $33, furnace, in carload lots, subject to the usual quantity differentials. Consumption of spiegeleisen per ton of steel has gained in the past two years. Ferromanganese continues on the basis of $99, duty paid, tide water, subject to quantity differentials.

Special ferroalloys are in a dull market. Prices are steady, except on tungsten. Chrome business is holding up much better than that of other alloys, due to demand for chrome nickel steels. Wolframite is nominal at about $4, a short ton unit bond, and domestic scheelite is held at $14 to $15, a short ton unit.

Pittsburgh—Ferroalloys continue quiet. Shipments of ferromanganese and spiegeleisen are near the lowest level of the year. Small lots of ferromanganese are $103.79, delivered. Ferrotungsten is dull, with the price generally $1.20. Ferrochrome shipments have moderated but activity in this material still compares favorably with that a year ago. Prices on other ferroalloys are unchanged.

Cincinnati—Ford Motor Co. is inquiring for 1000 tons of 25 to 28 per cent spiegeleisen.

Scrap

Deadlock Continues as Melters Oppose Prices and Dealers Refuse to Sell Lower

Chicago — Further pressure of iron and steel scrap melters has resulted in a drop of 25 cents in the price of heavy melting steel, the range being $12 to $12.25, gross, Chicago switching district. Drastic reductions of shipments have been asked by several large melters. A few yards have had shipping orders cut down more than 50 per cent within the last ten days. Resistance to buyers' pressure by brokers tends to make price reductions less sweeping. A number of industrial producers of scrap are unwilling to sell at present prices and much material is being held. While a perceptible decline is noted in the flow of scrap to this market, reduction of shipments and lower consumption leave a fairly even balance. Railroad off-

Iron and Steel Scrap Prices

Corrected to Tuesday noon. Gross tons delivered to consumers, except where otherwise stated.

HEAVY MELTING STEEL

Birmingham	10.50 to 12.00
Boston dealers	8.75 to 9.00
Buffalo, No. 1	13.00 to 13.75
Buffalo, No. 2	11.25 to 11.50
Chicago	12.00 to 12.25
Cinci., deal	11.00 to 11.50
Cleve., No. 1	12.00 to 12.25
Cleve., No. 2	11.25 to 11.50
Det., No. 1 deal	10.75 to 11.25
Det., No. 2 deal	9.50 to 10.00
E. Pa., del. mill	12.50 to 13.00
N. Y. dl. R. R.	9.00 to 10.50
N. Y. deal No. 2	7.00 to 7.50
N. Y., deal yd.	6.25 to 6.75
Pitts. No. 1	14.75 to 15.25
St. L., No. 1 sel.	11.25 to 11.75
Federal, Ill.	10.75 to 11.25
Granite C., Ill.	10.00 to 10.25
Valleys, No. 1	14.75 to 15.25

COMPRESSED SHEETS

Buffalo, dealers	11.25 to 11.50
Chicago	10.25 to 10.75
Cleveland	11.50
Detroit, dealers	10.50 to 11.00
E. Pa. new mat.	11.50 to 12.00
Pittsburgh	14.50 to 15.00
Valleys	13.75 to 14.25

BUNDLED SHEETS

Buffalo	9.00 to 9.50
Cinti, deal	10.25 to 10.75
Cleveland	9.00 to 9.25
Eastern Pa.	9.50 to 10.00
Pittsburgh	12.50 to 13.00
St. Louis	6.50 to 7.00

SHEET CLIPPINGS LOOSE

Chicago	7.50 to 8.00
Cincinnati	8.00 to 8.50
Detroit, dealers	8.00 to 8.50
St. Louis	6.50 to 7.00

STEEL RAILS SHORT

Birmingham	11.00 to 12.00
Boston, dealers	7.50 to 8.75
Buffalo	16.25 to 16.75
Chicago (3 ft.)	14.00 to 14.50
Chicago (2 ft.)	14.50 to 15.00
Cinti, deal	17.00 to 17.50
Detroit, deal	15.00 to 15.50
Pitts. (open-hearth, 3 ft. and less)	17.00 to 17.50
St. Louis	14.50 to 15.00

STOVE PLATE

Birmingham	10.00 to 11.00
Boston, con.	9.00 to 9.50
Buffalo	10.50 to 11.00
Chicago, net	9.50 to 10.00
Cinci., deal. net	8.25 to 8.75
Det., net, deal	9.00 to 9.50
Eastern Pa.	10.00 to 10.50
N. Y., deal, mill	6.00 to 6.50
St. Louis	9.25 to 9.75

COUPLERS, SPRINGS

Buffalo	16.00 to 16.50
Chicago	13.50 to 14.00
Eastern Pa.	17.00 to 17.50
Pittsburgh	17.00 to 17.50
St. Louis	12.00 to 12.50

ANGLE BARS—STEEL

Chicago	13.00 to 13.50
St. Louis	10.50 to 10.75

LOW PHOSPHORUS

Buf., billets and bloom crops	17.50 to 18.00
Cleve. bil. and bloom crops	17.50
Eastern Pa.	19.50 to 20.00
Pitts. billet and bloom crops	19.00 to 20.00
Pitts. sheet bar crops	18.00 to 18.50

FROGS, SWITCHES

Chicago	13.00 to 13.50
St. Louis	11.00 to 11.50

SHOVELING STEEL

Chicago	12.00 to 12.25
Cleveland	8.75 to 9.25
St. Louis	10.50 to 11.00

RAILROAD WROUGHT

Birmingham	10.00 to 10.50
Boston, dealers	7.50 to 8.00
Buffalo, No. 1	10.00 to 10.50
Buffalo, No. 2	13.50 to 14.00
Chicago No. 1	11.25 to 11.75
Chicago, No. 2	12.00 to 12.25
Cinti. No. 2	11.00 to 11.50
Eastern Pa.	15.00 to 15.50
N. Y., No. 1 dl.	10.50 to 11.00
Pitts. No. 2	14.75 to 15.25
St. Louis, No. 1	9.00 to 9.50
St. Louis, No. 2	11.00 to 11.50

SPECIFICATION PIPE

Boston	7.00 to 7.50
Eastern Pa.	12.00 to 12.50
N. Y., deal	7.25 to 7.50

BUSHELING

Buffalo, No. 1	11.25 to 12.75
Chicago, No. 1	9.50 to 10.00
Cinn., No. 1 dl.	9.25 to 9.75
Cinn., No. 2	6.25 to 6.75
Cleve., No. 2	8.25 to 8.50
Detroit, No. 1 new deal	9.75 to 10.25
St. L. No. 1	9.25 to 9.75
Val. new No. 1	13.00 to 13.50

MACHINE TURNINGS

Birmingham	7.50 to 8.50
Boston, dealers	4.00 to 4.50
Buffalo	8.00 to 8.50
Chicago	6.25 to 6.75
Cinn., deal	7.50 to 8.00
Cleveland	7.50 to 8.00
Detroit	5.75 to 6.25
Eastern Pa.	9.00
N. Y., deal	5.00 to 5.50
Pittsburgh	8.50 to 9.00
St. Louis	6.75 to 7.25
Valleys	10.25 to 10.75

BORINGS AND TURNINGS
For Blast Furnace Use

Boston, deal	3.50 to 4.00
Buffalo	9.00 to 9.50
Cinn., deal	8.00 to 8.50
Cleveland	8.75 to 9.25
Detroit, deal	7.00 to 7.50
Eastern Pa.	8.50
N. Y., deal	4.25 to 4.75
Pittsburgh	8.50 to 9.00

CAST IRON BORINGS

Birming. chem.	12.00 to 13.00
Birming. plain	7.50 to 8.50
Boston, chem.	9.00 to 9.25
Boston, deal.	3.75 to 4.25
Buffalo	9.00 to 9.50
Chicago	7.75 to 8.25
Cinn., deal.	8.00 to 8.50
Cleveland	8.75 to 9.25
Detroit, deal.	7.00 to 7.50
Eastern Pa.	9.00
E. Pa., chem.	14.00 to 14.50
N. Y., deal.	4.75
Pittsburgh	8.50 to 9.00
St. Louis	9.25 to 9.50

PIPE AND FLUES

Cinn., deal	9.00 to 9.50

RAILROAD GRATE BARS

Buffalo	9.25 to 9.75
Chicago, net	8.50 to 9.00
Cincinnati	9.00 to 9.50
Eastern Pa.	10.00
N. Y., deal	6.50 to 7.00
St. Louis	10.00 to 10.25

FORGE FLASHINGS

Boston, deal.	7.00 to 7.25
Buffalo	11.00 to 11.50
Cleve. ov. 10 in.	10.00 to 10.50
Detroit	9.50 to 10.00

FORGE SCRAP

Boston, deal.	6.00 to 6.50
Chicago	14.50 to 15.00
Eastern Pa.	12.00 to 12.50

ARCH BARS, TRANSOMS

Chicago, net	13.75 to 14.25
St. Louis	14.00 to 14.50

AXLE TURNINGS

Boston, deal.	6.75 to 7.00
Buffalo	11.50 to 12.00
Chi. steelworks	9.50 to 10.00
Cleveland	11.75 to 12.00
Eastern Pa.	11.00 to 12.00
Pittsburgh	12.50 to 13.00
St. Louis	9.25 to 9.75

STEEL CAR AXLES

Birmingham	19.00 to 20.00
Bos., ship. pt.	16.00 to 17.00
Buffalo	16.00 to 16.50
Chicago	16.80 to 17.35
Eastern Pa.	21.00 to 21.50
St. Louis	16.00 to 16.50

SHAFTING

Bost., ship pt.	13.00 to 13.50
Chicago	16.25 to 16.80
Eastern Pa.	18.00 to 18.25
N. Y., deal.	13.00 to 14.00
St. Louis	13.00 to 13.50

CAR WHEELS

Birming., iron.	10.00 to 11.00
Boston, iron	14.00 to 14.50
Buffalo, iron	13.50 to 14.00
Buffalo, steel	16.00 to 16.50
Chicago, iron	13.50 to 14.00
Chi., roll. steel	15.00 to 15.50
Cincinnati	12.00 to 12.50
N. Y., iron, dl.	10.00 to 10.50
Pitts., iron	15.50 to 13.00
Pitts., steel	17.00 to 17.50
St. Louis, iron	12.00 to 12.50
St. Louis, steel	13.75 to 14.25
E. Pa. steel	17.00 to 17.50
E. Pa. iron	14.50 to 15.00

NO. 1 CAST SCRAP

Birming., cup	12.00 to 13.00
Buffalo (mac.)	13.00 to 13.50
Boston, textile	11.50 to 12.00
Chicago, mach.	13.45 to 14.00
Chi., railroad	11.20 to 11.75
Chicago, agri.	10.90 to 11.50
Cinn., mach. cup., gross	17.75 to 18.25
Cleve, cupola	14.00 to 14.50
Det., net deal	10.00 to 10.50
E. Pa. cupola	13.50
N. Y. cup. deal.	9.50 to 9.75
N. Y., del. loc. foundries	14.00
Pitts. cupola	14.00 to 15.00
San Fran., del.	13.50 to 14.00
Seattle	14.00 to 14.25
St. L. No. 1 ma.	12.00 to 12.50
St. L. No. 1	11.00 to 11.50

HEAVY CAST

Boston	10.50 to 11.00
Bos. mach. cast	14.00 to 14.50
Buffalo, break.	8.50 to 9.00
Cleve., break.	9.00 to 9.50
Detroit, auto, net deal.	11.50 to 12.00
Det., break., dl.	7.00 to 7.50
Eastern Pa.	11.50 to 12.00
N. Y. No. 1 dl.	8.00 to 8.50
N. Y. break. dl.	7.25 to 8.60
Pittsburgh	11.50 to 12.00

MALLEABLE

Boston, R. R.	16.00 to 16.25
Buffalo	15.00 to 15.50
Chicago, agri.	12.00 to 12.50
Chicago, R. R.	13.50 to 14.00
Cinn., R. R. dl.	15.25 to 15.75
Cinn., agri., dl.	14.25 to 14.75
Cleve., rail	16.00 to 16.50
Det. auto deal.	13.50 to 14.00
St. Louis, rail.	11.00 to 11.50

RAILS FOR ROLLING
5 feet and over

Birming. cup	12.00 to 12.50
Boston	9.00 to 9.50
Buffalo	13.50 to 14.00
Chicago	14.50 to 15.00
Eastern Pa.	15.00 to 15.50
New York	9.50 to 10.00
St. Louis	12.00 to 12.50

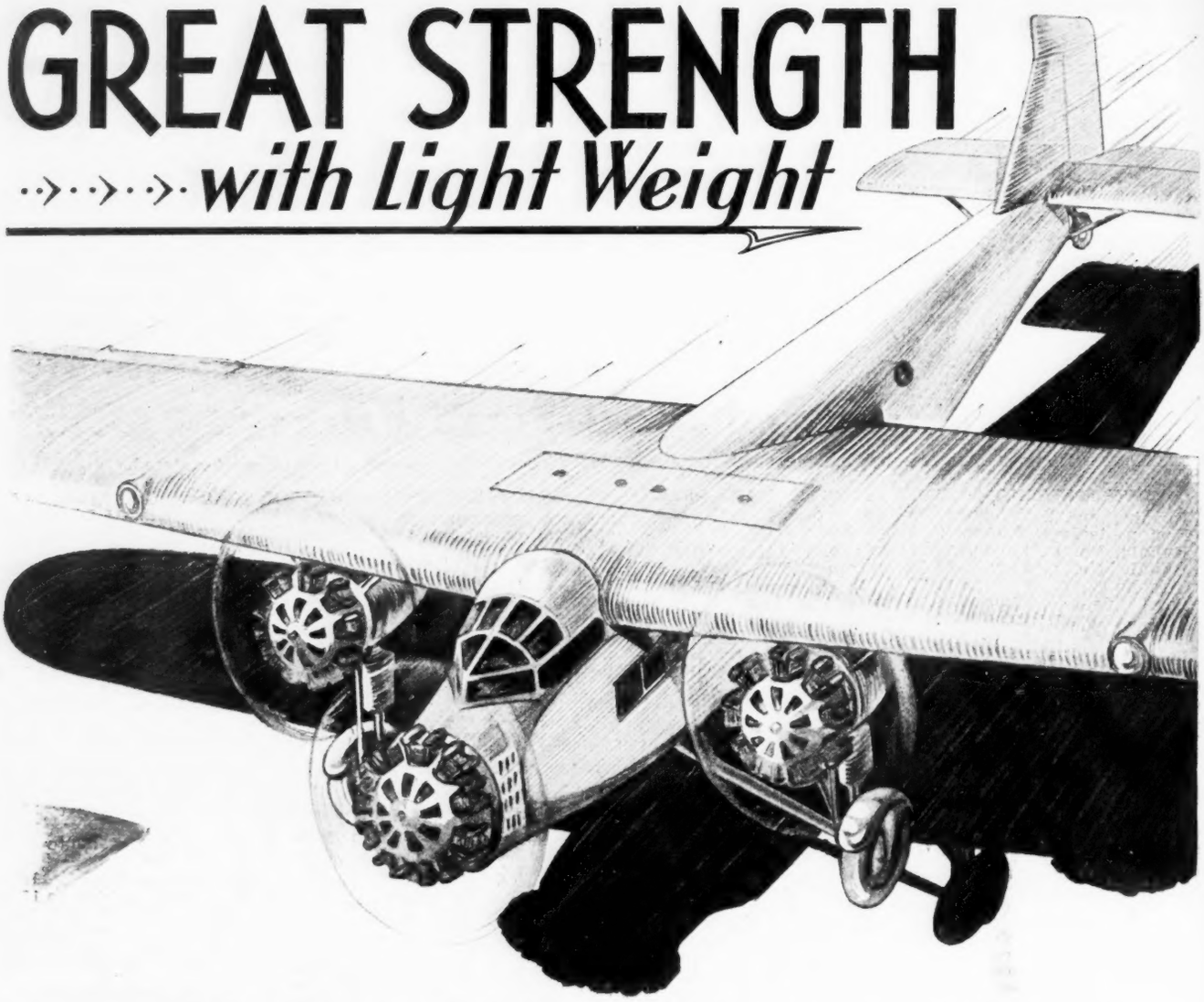
LOCOMOTIVE TIRES

Chicago, cut	15.00 to 15.50
St. L. No. 1	13.00 to 13.50

LOW PHOS. PUNCHINGS

Chicago	13.00 to 13.50
Pittsburgh	17.50 to 18.00
Eastern Pa.	17.00 to 18.00
Buffalo	17.00 to 17.50

GREAT STRENGTH
with Light Weight



TODAY'S terrific speeds demand exceptional strength of materials together with light weight. Stanley Alloy Steels, such as Chrome Molybdenum, are adequately fulfilling these requirements for many varieties of products.

For airplanes, automobiles — anywhere that lives depend upon strength of materials — these Special Steels are finding increasing use. Their light weight combined with great strength make them exactly suited for the job.

In your own case, Stanley Alloy Steels may cut down the weight of your finished product materially without sacrificing strength or wearing qualities.

We shall be glad to send samples of these steels and show you their advantages.

AMERICAN TUBE AND STAMPING PLANT
THE STANLEY WORKS
Bridgeport, Conn.

Save with Steel

Steel may do the work just as well as the more expensive material you are now using

STANLEY STEEL
Hot and Cold Rolled

erings are lighter. Rock Island, Santa Fe and Wabash have lists this week, but tonnages are below normal. Dealers are naming 50 cents lower on plate scrap. Railroad malleable is weak. Little outlet is shown for cast borings, owing to reduced merchant furnace operations.

Boston—Business in iron and steel scrap is not sufficient to test prices. Buying is for small shipments, while dealers and brokers are unable to get much of a supply as sellers are holding their materials.

New York—Foundry stove plate is easier, dealers buying prices going to $6.50 and under, New York. Other grades are unchanged. Demand is light. Yard stocks are not large on most grades. Heavy melting steel continues at $12.50, Coatesville. Some prices are untested, due to lack of interest.

Canadian Scrap

Dealers' Buying Prices

MONTREAL

Per Gross Ton

Iron axles	$15.00
Steel axles	13.00
Car wheels	11.00
Stove plate	10.00
Wrought pipe	5.00
Turnings	6.00
Heavy melting steel	8.00

TORONTO

Steel axles	10.00
Iron axles	12.00
Heavy melting steel	9.00
Turnings	6.50
No. 1 mach. cast (net)	11.00
Malleable (net)	9.00

Buffalo—Scrap markets are being established largely by sales of distress tonnage as neither dealers or consumers are anxious to make contracts. Some blast furnace scrap has been sold at $9.50, delivered here. Hold orders are being applied to many contracts.

Cincinnati—Dealers' quotations on heavy melting steel are showing a greater spread, with the maximum up 25 cents, at $11 to $11.50. Buying for a tonnage order recently placed has tended to make the market stronger.

Cleveland—No. 1 heavy melting steel has been reduced 25 cents a ton in the Cleveland district to a range of $12 to $12.25. No. 2 steel is also quoted lower at $11.25 to $11.50. Steel scrap is now the lowest in several years. Other grades continue unchanged and dull due to lack of consuming demand. Steelworks consumers show no interest and seem content to draw on stocks.

Detroit—Although iron and steel scrap was thought recently to have about reached bottom, decline in a few scattering grades continues. Heavy melting steel is down this week 25 cents to $10.25 to $11.25. Fifty cent reductions are noted in borings and 25 cent reductions in turnings. Output of scrap from automobile plants shows a decisive reduction this month. Demand, however, from the Youngstown and Pittsburgh districts is also off but some consumers show a slight tendency to buy, feeling that in the event the bottom of the market has been reached they will have protected themselves somewhat.

Birmingham, Ala.—Purchases are slow and in small lots. Quotations are unchanged and largely tentative. Heavy melting steel ranges between $10.75 and $11, delivered in the home district, to $12.

St. Louis—Except for the purchase of a round tonnage of steel by an East Side mill interest, the iron and steel scrap market has developed nothing of interest. Mills are feeling about for bargain material, and where they can pick it up are willing to purchase. Prices offered are too low to arouse the interest of dealers.

Philadelphia — Bethlehem Steel Co., after buying a fair tonnage of blast furnace borings and turnings from railroads and dealers at $7.50, delivered Bethlehem, now is offering $4.75, f.o.b. cars, New York, equivalent to $6.64, delivered Bethlehem. The same consumer, following purchases of No. 1 melting steel at $12, delivered Sparrows Point, is offering $11.50, delivered there. Shipments of unprepared scrap again are being restricted.

Pittsburgh—Tone of iron and steel scrap is fairly steady with activity improved by the purchase of a substantial tonnage of heavy melting steel by one consumer at $15. Supplies of this grade remain limited.

Toronto, Ont.—Consumers are showing little interest in scrap requirements and are placing orders only for immediate needs. Mills are taking delivery on contract and placing orders at intervals for special grades of steel scrap. Demand for iron scrap has fallen sharply. Prices are unchanged.

Coke

Production Further Curtailed in Connellsville District—Prices Reflect on Easy Tone

COKE PRICES, PAGE 90

Pittsburgh—Beehive coke production has experienced another sharp reduction, bringing output to the lowest level of the year, reflecting the inability of sellers to dispose of what little surplus fuel exists. Spot demand for furnace coke is light, with little improvement in sight. Producers still hold standard furnace coke at $2.50, inferior fuel bringing less. Foundry coke prices are steady on premium brands at $4.75 and $4.85, with ordinary grades going at $3.50 to $4.

Production of coke in the Connellsville region for the week ended July 5 was 21,200 tons, compared with 27,800 tons the preceding week and 92,970 tons in the same period a year ago, according to the *Connellsville Courier*.

Boston.—Demand for foundry coke is quiet. A continuation of cool weather and an announcement of an increase of 50 cents a ton to $13.75 in the price of domestic coke, effective Aug. 1, has maintained business in this grade and resulted in fairly good rate of oven operations.

New York—Specifications against second half coke contracts are comparatively small. By-product foundry coke continues $9 to $9.40, delivered at Newark, N. J.; $11, delivered in New England; and $9, delivered in Philadelphia. Premium brands of beehive coke continue $4.85, Latrobe, Pa., with standard brands $3.50 to $3.75, Connellsville. Beehive furnace coke continues $2.50, Connellsville.

Chicago—By-product foundry coke shipments show a marked decline compared with June. Prices are steady at $8, ovens, and $8.75 for local delivery.

Cincinnati — Foundry calls for shipments of by-product coke are off sharply. Oven interests see slight chance of July tonnage equaling that in June.

St. Louis—Coke shipments during the first half of July were the smallest of any similar period so far this year. Prospects for the remainder of the month are better as a number of consumers have released shipments temporarily deferred. Some foundries expect to increase operations.

Pacific Coast

First Half Tonnage Exceeds That of Preceding Two Years in Northwest—California Activity Larger—French Pipe Underbids Domestic on Second Bids—State Building Takes 1800 Tons

Seattle—Iron and steel products placed in the Pacific Northwest in lots of 100 tons or more during second quarter exceeded the totals for the first quarter. Likewise, first half sales were greater than for the corresponding periods in the last two years. Totals for second quarter were augmented by the 10,000 tons of steel and miscellaneous material required for the Aurora bridge, Seattle, awarded in June. However, the record for second quarter of 1930 is surprising in view of reduced industrial activity and decreased construction totals.

Pig Iron and Coke

Foundry activity is at a minimum. While some plants have considerable work in their shops, many are closed temporarily or working at reduced capacity. Prices of pig iron and coke are unchanged. Buying is limited as stocks are sufficient for immediate requirements.

Coast Pig Iron Prices

Utah basic	$25.00 to 26.00
Utah foundry	25.00 to 26.00
*German	24.25
*Indian	25.00 to 26.00

*C.i.f. duty paid.

Bars, Plates and Shapes

Inquiry for merchant bars and reinforcing materials is slow. No new work of importance has developed. Local mills have a fair tonnage on the books but recent awards have been almost entirely in lots of less than 100 tons. Northwest Steel Rolling Mills, Seattle, this week closed for 100 tons of concrete bars for a wall for the General Petroleum Co. and the gymnasium for the Lakeside school, Seattle.

No inquiry for large tonnages of plates has developed and no important projects are pending. Walla Walla, Wash., has opened bids for a water pipe job involving about 175 tons. Eugene, Oreg., has opened bids for boilers and equipment for a steam power plant. Awards are pending. General Electric Co., Schenectady, N. Y., was low for the turbo-generator and Allis-Chalmers Mfg. Co., Milwaukee, for the condenser.

The structural market is quiet. Local plants are well supplied with work for 60 days, however. Northwest Equipment Co., Portland, Oreg. has the contract for building a bridge over the Molalla river, near Canby, Oreg., involving 70 tons of shapes and 16 tons of reinforcing. Isaacson Iron Works, Seattle, has the contract for erecting 425 tons of structurals for the new buildings of the Pacific Coast Steel Corp.

Finished Materials

The month has opened slowly with the wholesale jobbing trade, due to the holidays and restricted industrial activity. Business is spotty, no particular item being in marked demand. Prices are unchanged. Portland is now working on a price parity with Seattle as far as bars, shapes, plates and sheets are concerned. On bands, hoops and cold finished steel Portland prices are 15c to 25c under Seattle.

French Pipe Again Low

Under readvertised bids the Pacific Water Works Supply Co., offering French pipe, was again low for furnishing 501 tons of 16-inch sand cast iron pipe for Olympia, Wash., and received the award. United States Pipe & Foundry Co. was low for centrifugally cast. This award is in addition to 328 tons of 10 and 12-inch pipe reported awarded to the Pacific States Pipe Co. several weeks ago. The American Cast Iron Pipe Co. booked 300 tons for Seattle local improvement projects on Eleventh avenue and Thirty-fifth avenue S.W.

Old Materials

Steel scrap is weaker, supplies being in excess of present requirements. Specifications at local mills have been revised so that only the better grades command the going prices. At the two Seattle plants prices range from $9.50, gross ton, for local scrap to $11 for material from outside points, depending on quality. Exporting houses are showing no interest. One local dealer, who is scrapping two navy vessels, is shipping 1500 tons of charging size steel scrap to Japan under an old contract and it is understood an equal amount is yet to be forwarded. Cast iron scrap is weak and arouses practically no interest as foundries are buying only in limited tonnages. The average price remains about $12.50, net ton.

Better Demand Appears

San Francisco—*(By Air Mail)*—Trading on the Pacific Coast for iron and steel products was interrupted to some extent by the week end holiday last week, and activity is not yet under full way. Demand for structural shapes and reinforcing steel bars has improved somewhat and a number of construction and highway projects are being figured or will be up for quotations within the next few weeks.

Among the more important new inquiries are 1800 tons of shapes for a state building in Los Angeles and over 1000 tons of cast iron pipe for San Francisco.

Bars, Plates and Shapes

California placed 438 tons for paving work in San Mateo county, with an unknown company. In addition to the larger lots placed, numerous small tonnages were booked. Bids were received this week on 275 tons for paving work in Yuba City, Calif., and on 200 tons for a warehouse in Los Angeles. New inquiries call for 277 tons for a subway crossing on Broadway, Tucson, Ariz., bids on which will be opened Aug. 4. Out-of-stock prices continue firm in the San Francisco district at 2.30c, base, Los Angeles quotations being $2 a ton higher.

The Western Pipe & Steel Co. took 598 tons for a 42 and 54-inch welded steel pipe line for the Salyer Consolidated Mining Co. at Eureka, Calif. The Lacy Mfg. Co. also secured 150 tons for a storage tank for the Pacific Molasses Co., Los Angeles. While prices are being fairly well maintained at 2.25c, c.i.f., 2.15c, is being named on more desirable tonnages.

New structural business in sight is encouraging to fabricators and includes 473 tons for a subway crossing in Tucson, Ariz., and 137 tons of sheet steel piling for the United States engineers office, at Sacramento, Calif. Bids were opened this week on 168 tons for a bridge over the Trinity River in California. No change in prices is noted on plain shapes, 2.25c, c.i.f. being firm.

Demand for cast iron pipe reflects the usual summer lull and awards this week totaled less than 750 tons. The United States Pipe & Foundry Co secured 265 tons of 12 and 16-inch Class B pipe. Included among the new inquiries were 140 tons for Eureka Calif., and 1031 tons for San Francisco.

Steel and Cast Iron Pipe--Tubing

Welded Iron, Steel Pipe

Base Price $200 per ton

Base Discounts, Pittsburgh and Lorain, O., to jobber in carloads

Indiana Harbor, Ind., and Evanston, Ill., 2 points less. Chicago del., 2 points less.

BUTT WELD

Steel In.	Blk.	Gal.	Iron In.	Blk.	Gal
½	58	44½	½	22	2
¾	62	50½	¾	28	11
1—3	64	52½	1—1½	30	13

LAP WELD

2	57	45½	2	23	7
2½—6	61	49½	2½	26	11
7—8	58	45½	3—6	28	13
9—10	56	43½	7—12	26	11
11—12	55	42½			

BUTT WELD

Extra strong, plain ends

½	55	44½	¼—⅜	19	+54+
¾	60	49½	½	21	17
1—1½	62	51½	¾	28	12
2—3	63	52½	1—1½	30	14

LAP WELD

Extra strong, plain ends

2	55	44½	2	23	9
2½—4	59	48½	2½—4	29	15
4½—6	58	47½	4½—6	28	14
7—8	54	41½	7—8	21	7
9—10	47	34½	9—12	16	2
11—12	46	33½			

To large jobbers these discounts on steel pipe increased on black by 1 point and two discounts of 5 per cent; on galvanized by 1½ points with two 5 per cents. On iron pipe large jobbers obtain additional discount of 1 point with 5 and 2½ per cent on black and galvanized.

BOILER TUBES

Carload Discounts, Lap Welded Steel		f.o.b. Pittsburgh Charcoal Iron	
2—2¼	38	1¾	8
2½—2¾	46	2—2¼	13
3	52	2½—2¾	16
3¼—3¾	54	3	17
4	57	3¼—3½	18
4½—6	46	4	20
1½	1	4½	21

On lots of a carload or more, above base discounts subject to preferential of two 5 per cent discounts on steel and 10 per cent on charcoal iron. Smaller quantities subject to following modifications from base discounts.

Lap Welded Steel—Under 10,000 pounds, 6 points under base and one 5 per cent; on 10,000 pounds to carload, 4 points under base and two 5 per cents. Charcoal iron—under 10,000 pounds, 2 points under base; on 10,000 pounds to carload, base and one 5 per cent.

STANDARD COMMERCIAL SEAMLESS BOILER TUBES

COLD DRAWN

1	61	3	46
1¼—1½	53	3¼—3½	48
1¾	37	4	51
2—2¼	32	4½, 5, 6	40
2½—2¾	40		

HOT ROLLED

2—2¼	38	3¼—3½	54
2½—2¾	46	4	57
3	52	4½, 5, 6	46

Subject to 5 per cent supplementary discount for carload lots. On less than 10,000 pounds, base discount reduced 6 points. On 10,000 pounds to carload, base discount reduced 4 points and one 5 per cent allowed. No extra for lengths up to and including 24 feet. Sizes smaller than 1 inch and lighter than standard gage to be held at mechanical tubes list and discount. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

SEAMLESS TUBING

Cold drawn; f.o.b. mill

Random lengths over 5 ft.....55%
Selected lengths, 1 to 18 ft.....53%

Cast Iron Water Pipe

Class B Pipe—Per Net Ton

Six-inch and over, Bir. $37.00 to 38.00
Four-inch, Birmingham 41.00 to 42.00
Four-inch, Chicago ..... 49.20 to 50.20
Six to 24-inch, Chicago 45.20 to 46.20
Six-inch and over, N. Y. 38.50 to 40.50
Four-inch, New York .... 41.50 to 42.50
Stand. fittings, Bir. base.... $100.00

Six to 24-inch, base; over 24-inch plus $20; 4-inch, plus $10; 3-inch, plus $20; gas pipe fittings, $5 higher.

Class A pipe $4 higher than Class B.

Warehouse Quotations at Leading Centers, in Cents Per Pound

STEEL BARS

Baltimore	3.00c
Boston	3.265c
Buffalo	3.30c
Chattanooga	3.25c
Chicago	3.00c
Cincinnati	3.30c
Cleveland	3.00c
Detroit	3.00c
Houston	3.00c
Los. Ang.	3.40c
New York††	3.10c
Philadelphia	2.70c
Pittsburgh	2.90c
Portland	3.15c
San Frans.	3.40c
Seattle	3.15c
St. Louis	3.15c
St. Paul	3.25c
Tulsa	3.65c

IRON BARS

Baltimore	3.25c
Boston	3.265c
Buffalo	3.30c
Chattanooga	3.25c
Chicago	3.00c
Cincinnati	3.30c
Detroit	3.00c
New York††	3.10c
Philadelphia	2.70c
St. Louis	3.15c
Tulsa	3.65c

REINFOR. BARS

Baltimore	2.50c-3.31c
Boston	2.665c
Buffalo	2.95c
Chattanooga	3.25c
Cincinnati	3.30c
Cleveland	2.25c-2.44c
Detroit	2.30c-3.00c
Houston	3.00c
Los Ang. cl	2.40c
Los Ang. lcl	2.70c
New York	2.65c-3.10c
Philadelphia	2.55c
Pittsburgh	2.75c
San Fran. cl	2.30c
San Fran. lcl.	2.60c
Seattle	3.15c
St. Louis	3.15c
Tulsa	3.65c
Young.	2.30c-2.60c

SHAPES

Baltimore	3.00c
Boston	3.365c
Buffalo	3.40c
Chattanooga	3.35c
Chicago	3.10c
Cincinnati	3.40c
Cleveland	3.00c
Detroit	3.10c
Houston	3.25c
Los. Ang.	3.40c
New York	3.10c
Philadelphia	2.60c
Pittsburgh	3.00c
Portland	3.15c
San Fran.	3.40c
Seattle	3.15c
St. Louis	3.25c
St. Paul	3.35c
Tulsa	3.75c

PLATES

Baltimore	3.00c
Boston	3.365c
Buffalo	3.40c
Chattanooga	3.35c
Chicago	3.10c
Cincinnati	3.40c
Cleveland, ¼-in. and thicker	3.00c
Clev., 3/16-in	3.20c
Detroit	3.10c
Det., 3/16-in.	3.10c
Houston	3.00c
Los Angeles	3.40c
New York	3.30c
Philadelphia	2.60c
Pittsburgh	3.00c
Portland	3.15c
San Fran.	3.40c
Seattle	3.15c
St. Louis	3.25c
St. Paul	3.35c
Tulsa	3.75c

NO. 10 BLUE

Baltimore	3.50c
Bost. 3/16-in.	3.915c
Buffalo	3.50c
Chattanooga	3.75c
Chicago	3.35c
Cincinnati	3.45c
Cleveland	3.25c
Detroit	3.35c
Houston	3.90c
Los Ang.	3.95c
New York	3.40c
Portland	4.00c
Phila. *†	3.15c
Pitts. **	3.25c
San Fran.	3.80c
Seattle	4.00c
St. Louis	3.45c
St. Paul	3.545c
Tulsa	3.95c

NO. 24 BLACK

Balt. *†	3.75c
Boston	4.70c
Buffalo	4.20c
Chicago	4.05c
Cincinnati	4.05c
Clev. ***	3.75c
Detroit	3.95c
Los Ang.	4.70c
New York	3.55c to 3.65c
Phila. *†	3.70c
Pitts. **	3.65c
Portland	5.00c
San Fran.	4.35c
Seattle	5.00c
St. Louis	4.25c
St. Paul	3.79c
Tulsa	4.45c

NO. 24 GAL. SHEETS

Balt. *†	4.50c
Boston	5.45c
Buffalo	4.40c to 4.60c
Chicago (lc. del.)	4.60c
Chicago (outside shipment)	4.35c to 4.60c
Cincinnati	4.90c
Cleveland***	4.35c
Detroit	4.60c
Houston	5.40c
Los Ang.	5.10c
Pitts. **	4.30c
New York	4.25c
Phila. *†	4.25c
Pitts. **	4.30c
Portland	5.50c
San Fran.	5.00c
Seattle	5.50c
St. Louis	4.85c
St. Paul	4.58c
Tulsa	5.35c

BANDS

Baltimore	3.50c
Boston	4.015c-5.00c
Buffalo	3.65c
Chattanooga	3.45c
Chicago	3.20c
Cincinnati	3.50c
Cleveland	3.25c
Det. 3/16-in. & lighter	3.30c
Houston	3.65c
Los Ang.	4.30c
New York	3.40c
Philadelphia	3.00c
Pittsburgh	3.25c
Portland	3.50c
San Fran.	3.75c
Seattle	4.15c
St. Paul	3.50c
Tulsa	3.85c

HOOPS

Baltimore	3.50c
Boston	5.50c-6.00c
Buffalo	4.05c
Chicago	3.75c
Cincinnati	4.05c
Cleveland	3.65c
Det. No. 14 & lighter	3.80c
New York	3.75c
Philadelphia	3.25c
Pittsburgh	4.25c
Seattle	5.15c
St. Paul	4.00c

COLD FIN. STEEL

Rounds & Hexagons

Baltimore (c)	3.30c
Boston	3.50c
Buffalo	3.15c
Chattanooga*	3.85c
Chicago	3.35c
Cincinnati	3.80c
Cleveland	3.40c
Detroit	3.65c
Los Ang. (a)	4.50c
New York	3.50c
Philadelphia*	3.40c
Pittsburgh	3.35c
Portland (a)	4.50c
San. Fran.(a)	4.25c
Seattle (a)	4.75c
St. Paul (a)	3.85c
St. Louis	3.60c
Tulsa	4.75c

Flats and squares 50c extra, except Tulsa, where 5.14c is quoted. (a) Rounds, hex. only.

COLD ROLL. STRIP

Boston 0.100-in 500 lbs. lots	5.30c
Buffalo	5.65c
Chicago (soft) (b)	6.15c
Cincinnati	6.10c
Clev. (b)	5.95c
Detroit	5.40c
New York	5.05c
Phila. (c)	4.95c

(b) Net base, straightening, cutting, boxing 1 ton or more.
(c) Plus mill, size and quantity extras.

††Domestic bars.
*Plus quantity extras.
**Less than 25 sheets.
*†50 or more bundles.
***Less 0.15c where more than 10 bundles are ordered at once for delivery at one time.

Abrasion Resistance — An Inherent Quality of AMSCO Manganese Steel!

The rapid self-hardening in service of the working face of a Manganese Steel casting has no counterpart in any other alloy cast steel.

Because we wanted facts on abrasion resistance instead of conjecture, the AMSCO Research Department designed and built the Fahrenwald abrasion testing machine which has been used for making 2000 tests with 150 alloy steels. In these tests were included the whole range of alloy steels, including chrome molybdenums, chrome nickels, chrome vanadiums and manganese steels, each analysis of which was subjected to from one to thirty different heat-treatments.

The results of these exhaustive tests, the first authoritative figures on abrasion resistance, definitely prove the superiority of AMSCO Manganese steel in this respect. Added to a Work Factor immensely superior to other alloy cast steels, this abrasion resistance makes AMSCO Manganese Steel without a rival in battering, grinding, punishing service.

AMSCO Manganese Steel is well suited and economical for cast parts in equipment subject to shock, breakage stresses and wear. Its use will return dividends on the investment in longer life, maintenance reduction and relief from the worries of repair and break-down.

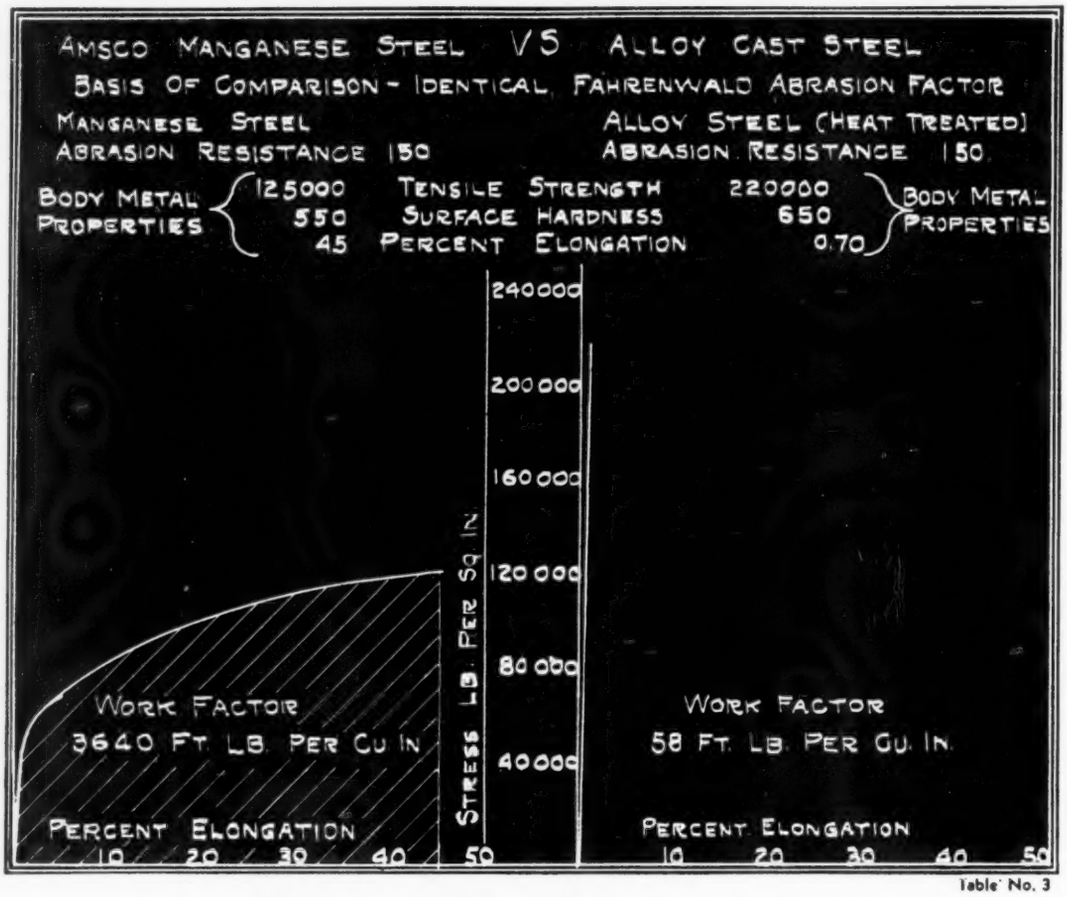


Table No. 3

Here Are The Facts!

On the basis of identical abrasion resistance, Manganese Steel shows to great advantage in its Work Factor in comparison with other alloy cast steels. In special alloys of a composition and heat-treatment to yield an abrasion resistance equal to that of AMSCO Manganese Steel, their surface hardness must be around 650 Brinell. This means also an extremely high tensile strength but practically zero elongation and very great brittleness. (See Table No. 3.)

For other alloy cast steels to equal the abrasion resistance of AMSCO Manganese Steel, they must not even be tempered to draw the quenching strain, and, consequently, at that hardness are utterly unreliable for all structural purpose. The Work Factor for steels so made and treated is practically zero. The Brinell of 550 for the working surface of Manganese Steel is developed in service, and the other values given are typical of the body metal that backs up the extremely hard working face.

AMERICAN MANGANESE STEEL COMPANY, 378 EAST 14th STREET, CHICAGO HEIGHTS, ILLINOIS

Foundries and Sales Offices at Chicago Heights, Illinois—Burnside, Chicago, Illinois—New Castle, Delaware—Oakland, California — Los Angeles, California — Denver, Colorado — St. Louis, Missouri. FAHRALLOY General Sales Office at St. Louis, Missouri.

AMSCO

Sales Offices at New York City—Boston —Easton, Pa.—Lakeland, Fla.—Pittsburgh—Cleveland — St. Paul — Lynchburg, Va.— Portland, Ore.—Seattle — Vancouver — Winnipeg—Houghton, Mich.—Birmingham —New Orleans—Tulsa—Pittsburg, Kans. — Salt Lake City.

Metals

Prices Appear Steadier as Producers Lighten Pressure for Sales—Products Are Cut

New York—Nonferrous metal prices appear steadier after another week in which sales pressure forced them to lower levels. Producers are not pressing the market quite so much as they did a week ago.

Many market men believe that prices are at bottom levels. Many prices are the lowest since the depression of 1921. The reduced pressure to sell also means that a number of producers would rather accumulate larger stocks than to sell freely at current prices. However, consumers are well covered on needs for one to two months ahead in copper and zinc, so that it is difficult to tell just how current market values will be sustained through midsummer quietness. Users of tin are believed to be moderately well covered while users of lead appear to be poorly protected on their needs.

Brass and copper mill product prices have been reduced to the basis of copper at 11.50c. New business is extremely light.

Copper—Most producers dropped to 11.50c, Connecticut, about a week ago after they had held for 12.00c for some time. With all business going at the lower figure to a few custom smelters and one or two other producers who met the lower price secretly, it became useless for producers to hold longer at the higher figure. June statistics showed an even balance between total production and total shipments for the first time since last October. Refined stocks increased more than 8000 tons, but blister stocks were cut slightly more than this increase. Stocks of refined copper are only slightly less than the peak of 1921. Total stocks of refined and blister copper also are a little under the 1921 peak.

Zinc—Prime western prices have been between 4.05c, East St. Louis, the lowest since 1908, and 4.20c. A number of smelters are less anxious to sell metal, with the result that the market at times is made on a narrow source of supply. A factor favoring firmness is the stability of ore at $29 a ton.

Tin—After the price had fallen almost to 29.00c, a new low, it recovered moderately with more active purchases by consumers than in a number of weeks. The weak condition of this market, however, was reflected by the fact that as soon as buying was over the price again began to sag.

Lead—Buying has been fair. A few large lots have been done for August shipment but nearly all buying has been in small lots for early delivery.—*Daily Metal Trade.*

Mill Products

Base price cents per pound f.o.b. mill, except where otherwise specified Copper and brass product prices are based on 11.50c, delivered Connecticut, for copper

SHEETS	
Yellow brass (high)	18.25
Copper, hot rolled	21.25
Lead, full sheets (cut ½c more)	9.00
Zinc sheet (100-pound base)	$9.50
TUBES AND PIPES	
Seamless yellow brass (high)	23.25
Seamless copper	23.50
RODS	
Yellow brass (high, full turnings)	16.50
Naval brass	19.37½
ANODES	
Copper, untrimmed	18.75
WIRE	
Yellow brass (high)	18.75

Old Metals

Dealers' buying prices, cents per pound

HEAVY RED BRASS	
New York	7.25 to 7.50
Chicago	6.75 to 7.00
Cleveland	7.50 to 8.00
St. Louis	7.00 to 7.50
HEAVY YELLOW BRASS	
Cleveland	4.50 to 5.00
HEAVY COPPER AND WIRE	
New York	8.50 to 9.00
Boston	8.50 to 9.00
Chicago	9.00 to 9.25
Cleveland	8.00 to 8.50
St. Louis	7.50 to 8.00
RED BRASS BORINGS	
New York	6.75 to 7.25
YELLOW BRASS TUBING	
Cleveland	4.50 to 5.00
LIGHT COPPER	
New York	7.00 to 7.50
Chicago	7.00 to 7.25
Cleveland	7.00 to 7.50
St. Louis	7.00 to 7.50
LIGHT BRASS	
Boston	4.00 to 4.50
Chicago	3.50 to 4.00
Cleveland	3.50 to 4.00
St. Louis	4.00 to 4.50
ZINC	
New York	2.00 to 2.25
Cleveland	1.75 to 2.00
St. Louis	2.00
ALUMINUM	
Clippings, soft, Cleveland	12.00 to 12.50
Clippings, hard, Cleveland	8.00 to 8.50
Borings, Cleveland	5.00 to 5.50
Cast, Cleveland	7.00 to 7.50
Cast, Boston	7.50 to 8.00
Cast, St. Louis	7.50

Secondary Metals

Remelt aluminum No. 12	15.50
Brass ingot, 85-5-5-5	11.00

Coke By-Products Demand and Output Curtailed

New York—Demand and production of coke by-products has been curtailed. Prices are generally unchanged, but some shading is reported in distillates. Benzol for chemical uses is unchanged, but motor fuel benzol has moved around 17.00c and 18.00c in tanks. Demand for toluol is still off, due largely to curtailment in auto production.

Phenol buying is spotty. Production of naphthalene has tapered off with shipments. Contract shipments have been completed. What business now taken is spot, which is not large.

Sulphate of ammonia season is also over. Spot business is not active. Some shading of $2.10 has been noted in the 100-pound price.

Coke By-Products

Per Gallon at Producers' Plants in Tank Lots

	Spot
Pure benzol	$0.21
90 per cent benzol	0.21
Toluol	0.30
Solvent naphtha	0.25
Commercial xylol	0.25

Per Pound at Producers' Plants in 250-Pound Drums

Phenol	0.16 to 0.17

Per Pound at Producers' Plants

Naphthalene flakes	0.04½ to 0.05½
Naphthalene balls	0.05½ to 0.06½

Per 100 Pounds Delivered

Sulphate of ammonia	$2.10 to $2.20

Prices of the Week, Cents a Pound

	Copper—Electro delivered	Copper—Lake delivered	Copper—Casting refinery	Straits Tin Spot New York	Straits Tin Futures New York	N. Y. Lead	Lead St. L. East	Zinc St. L.	Aluminum 98-99%	Antimony Spot	Nickel Ingot
July 9	11.50	11.57½	11.62½	29.37½	29.87½	5.25	5.15	4.10	22.90	6.75	35.00
July 10	11.50	11.57½	11.37½	29.37½	29.62½	5.25	5.15	4.07½	22.90	6.80	35.00
July 11	11.50	11.57½	11.37½	29.55	30.00	5.25	5.15	4.10	22.90	6.80	35.00
July 12	11.50	11.57½	11.37½	.....	.....	5.25	5.15	4.10	22.90	6.80	35.00
July 14	11.50	11.57½	11.37½	29.37½	29.75	5.25	5.15	4.12½	22.90	6.80	35.00
July 15	11.50	11.57½	11.37½	29.50	29.85	5.25	5.15	4.12½	22.90	6.75	35.00

Europe

Continent Feels American Steel Competition—German Idleness Increasing—Prices Are Cut

Birmingham, Eng. — (*European Staff Service*)—British markets continue quiet and traders hold out no hope of improvement until the August holidays are over. The Birmingham quarterly meeting will afford an opportunity for reviewing the situation and prospects for the new quarter, but improvement in volume of business is not to be expected.

In the steel trade, works are finding it difficult to carry on owing to shortage of specifications against contracts. Works engaged on shipbuilding material hope to benefit from orders which have just been placed for two large whale tankers to be built on the Tees. A few structural steel orders in the north have also helped the mills but demand from the Midlands for this class of steel is small. The amount of foreign steel being bought is not large but is sufficient to affect seriously the home position inasmuch as it means a certain displacement of the home trade. Some works are doing no more than two days a week. In South Staffordshire the steel position is worse than last week and makers find it more difficult than ever to keep going. Both the finished steel and iron output has to be slowed down somewhat owing to hot weather.

Finishing Mills Share Slump

Iron strip mills are working from Tuesday until Saturday and manufacturers think they are in a fortunate position. The marked bar mills are alone in their ability to make a full week despite the fact that this iron is needed only for special engineering purposes and the price of £12 10s ($60.75) a ton is high in comparison with any other iron and steel bars. Belgian No. 3 is offered here at about £5 16s ($28.18) and is finding a good deal of inquiry and a certain amount of business. Other Continental products are in no better demand and uncertainty in regard to prices prevents business. Merchants say that all quotations are unchanged but the actual prices at which business is being done show a wide variation.

The tin plate trade is now sharing in the depression. Prices are weaker and the basis is now recognized as 18s ($4.38). The canning industry is in a poor state. Shipments from Swansea last week were up by over 67,000 boxes. Manufacturers do not hold hope of selling tin plate below the 18s ($4.38) basis. In fact they suggest that they would sooner curtail output. Galvanized sheets continue quiet but some works in the Midlands are finding improvement partly from the home trade and partly from export, despite the fact that the Far Eastern markets are still very disappointing. In Swansea makers are quoting £12 ($58.32) and some works in the Midlands are asking 7s 6d ($1.81) more than the basis of £11 17s 6d ($57.70).

In Scotland the tube trade remains depressed and the butt welded plants are either on short time or closed down. The second quarter in the shipbuilding industry has shown considerable improvement and if this is maintained Scottish steel makers expect to benefit.

At the Midland meeting news came that offers of supplies of pig iron have been received from Luxemburg at a price competitive with Midland iron, even when freight charges are added. This is the first time that buying of Continental pig iron has been considered since the coal strike of 1926. It is doubtful whether any considerable tonnage will be bought because the position at foundries is no better and therefore does not warrant expansion in tonnage. The position, however, is serious for Midland pig iron producers who have steadfastly refused to lower prices, especially in view of the fact that they are paying much less for their fuel now than when they fixed prices eight months ago. Midland furnaces are turning out more iron than can be absorbed as consumers are buying only odd lots for immediate consumption.

Iron Competition Grows Keen

In the Middlesbrough pig iron trade it is stated that although some iron is coming from other British centers into the district, Continental material is gaining a footing. Makers are stubborn in their refusal to reduce prices as they say the gain from cheaper raw material is too small to pass on to consumers. Output has been reduced to match present demand. Little progress is being made in export trade and shipments for June were considerably below those for May. East coast hematite stocks are so heavy that merchants and producers are pressing iron on the market at a loss. Buyers contend they have bought east coast mixed numbers at £3 11s ($17.25). There is an early prospect of more hematite furnaces going out of blast. As a result there will probably be some curtailment in output of coke. There is a glut of this material in the north of England and in the Midlands.

In North Lincolnshire two furnaces are to be damped down. For some time this district has been fortunate and has felt the depression less than

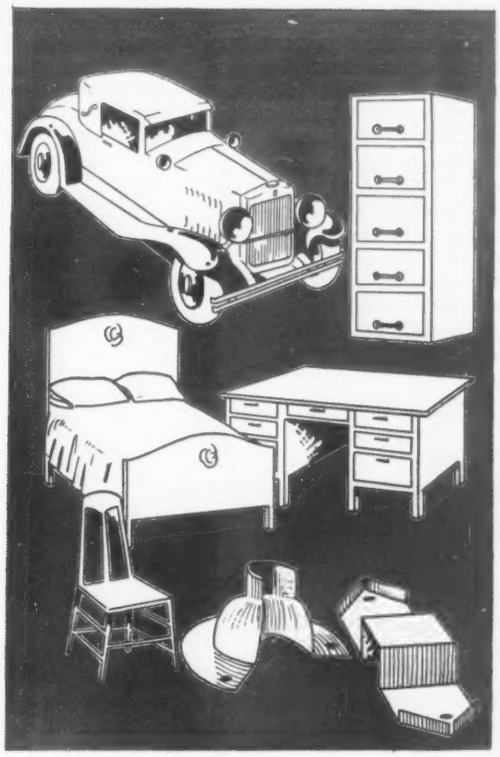
Entente Further Narrows Its Control of Prices

London—(*By Cable*)—The European steel entente has withdrawn price control from bars, plates and hoops. The entente now only controls prices of semifinished steel and beams. Its control over structural shapes broke down recently, when sellers booked combination orders including shapes, at discounts. Paris, Brussels and Berlin report export markets increasingly unsatisfactory.

In Britain the pig iron situation is becoming more discouraging. Midland prices are shaded 2 shillings (49 cents), following a similar reduction in continental iron. Several more furnaces in South Wales, Middlesbrough and Barrow have been banked. Steelworks in South Wales are closing due to foreign imports, estimated at 25,000 tons of steel weekly. The only bright spot is shipbuilding at Middlesbrough. Demand for galvanized sheets is slightly better; tin plate is quiet.

Production of pig iron in Great Britain in June amounted to 563,200 tons, compared with 614,500 tons in May, and 657,800 tons in June, 1929. Eight furnaces were banked in June. Steel ingot and castings output in June totaled 600,100 tons, compared with 692,800 tons in May, and 830,900 tons in June last year.

British iron and steel imports in June were 214,504 tons, against 233,725 tons in May, and 234,208 tons in June, 1929. June exports amounted to 250,969 tons, compared with 294,729 tons in May, and 306,847 tons in June last year.



Super Quality

Full-Finished Sheets

For years APOLLO STEEL COMPANY has been making various kinds of sheets—and has built up a reputation for quality and dependability of product.

With this wealth of experience and the addition of the newest of equipment (pyrometer controlled) we offer the latest APOLLO STEEL COMPANY product — FULL-FINISHED SHEETS—with fullest confidence that they will meet the most rigid specifications of manufacturers of Automobile Bodies, Metal Furniture, or Stampings.

"SAVE WITH STEEL"

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CINCINNATI	1002 American Bldg.
DETROIT	2034 Dime Bank Bldg.
INDIANAPOLIS	508 Illinois Bldg.
LOS ANGELES	Orpheum Bldg.
LYNCHBURG	612 Krise Bldg.
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NEW YORK	1372 Hudson Term. Bldg.
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other pig iron making centers. In Derbyshire also demand for cast iron pipes accounts for much of the pig-iron output. In Scotland pig iron makers are competing with material from India and the Continent.

Scrap merchants complain of lack of business. While steel works are on short time there is no demand for steel scrap and the only fortunate department is wrought iron scrap which has kept up comparatively well. Prices have not touched bottom but it is impossible to define the actual freights being paid as a good deal of bargaining is going on between buyers and sellers.

European Steelmakers Feel American Competition

Brussels—(*European Staff Service*)—The situation of the Belgian export market remains dull, and orders are scarce. The tendency of the American metallurgical industry is certainly influencing continental activity, inasmuch as the decrease of consumption in the United States is urging producers toward export trade. In fact, the American industry is competing with European works in Japan or in South America. Particularly in regard to wire rod, it is reported that for many orders offered by the Japanese, competition is severe. Consequently, there is a decrease in prices, and the decrease of orders is causing unemployment in Great Britain and Germany, there being 2,647,000 workers unemployed in the latter country.

In Belgium the situation is better, although it has been necessary to reduce prices of some commodities. This is particularly the case for coal. Industrial grades are unsold, but domestic grades are in a better position. Prices are falling and stocks are important. It is officially announced that a reduction will be applied as from July 1.

The pig iron market is bad, and British grades are competing in Belgium. It has been decided to quote new prices for foundry pig iron, as follows: for delivery in England, £3 3s ($15.33), against £3 4s ($15.57), f.o.b. Antwerp; for overseas delivery, £3 5s ($15.81), compared with £3 7s ($16.30), f.o.b. Antwerp; for Holland, £3 5s ($15.81), against £3 6s ($16.06), f.o.t. Dutch border; for Switzerland, 79 Swiss francs, compared with 84 Swiss francs, f.o.t. Bale; for Austria, £3 2s ($15.08), against £3 5s ($15.81), f.o.t. Wentosdorf; for Italy, £2 17s ($11.43), compared with £3 2s ($15.08), f.o.t. Thionville.

A meeting of the international cartel was held in London June 18. The quota of production for the next three months remains the same as for the preceding quarter. In fact, the various groups are far behind the tonnage fixed, and no penalty will have to be applied. The general organization of the international export comptoirs has been discussed, and it is expected that this question soon will be solved. It is hoped that selling agencies will be established in every country in which it is possible to sell in the manner of a pool.

The situation in regard to bars, channels, beams and semifinished products remains the same. Orders are booked with rebates of 3s (73c), 4s (97c) and 5s ($1.21) for ordinary qualities, but for special open-hearth steel rebates amount to over £1 ($4.87).

British Steel and Iron Shipments Shrink Further

Birmingham, Eng.—The aggregate tonnage of iron and steel shipments from Middlesbrough in June was 57,546 which compares with 62,833 tons in May and 80,991 in March. This, is the lowest since January 1927, when the industry was still crippled by the coal strike. Steel shipments are no worse than in April or May, but there has been a significant contraction in trade with Australia, owing to the imports ban, and India, where high tariff walks have to be surmounted. This decline has been offset by bigger shipments to the Argentine. No improvement is anywhere to be found in the pig iron trade. The total shipped was 12,456 tons, of which 6433 went abroad and 6023 coastwise to British ports. In the foreign shipments are included 500 tons to America. The largest shipment to any country, and incidentally the only one over 1000 tons, is that to Denmark of 1115 tons. Japan took 816, Italy 800, France 550 and Germany 415 tons.

Total steel shipments were 41,016 tons, of which 30,302 tons were to foreign destinations. The Argentine bought 7393 tons, India 5479 and Tanganyika 4460 tons.

Current Iron and Steel Prices of Europe

Dollars at Rates of Exchange, July 14	*British* Gross Tons U. K. Ports	£ s d	*French* Metric Tons Channel Ports	£ s d	*Belgium and Luxemburg* Metric Tons Channel Ports	£ s d	*German* Metric Tons Rotterdam or North Sea Port	£ s d
Export Prices f. o. b. Ship at Port of Dispatch—By Cable								
PIG IRON								
Foundry No. 3, Silicon 2.50-3.00	$15.44	3 7 6*	$15.83	3 5 0	$15.83	3 5 0	$15.83	3 5 0
Basic-bessemer	15.95	3 5 6†	14.61	3 0 0	14.61	3 0 0	15.83	3 5 0
Hematite, Phosphorus 0.02-0.05	17.29	3 11 0	24.76	630*	.....	.....	17.78	3 13 0
SEMIFINISHED STEEL								
Billets	$29.22	6 0 0	$22.89	4 14 0	22.89	4 14 0	$22.65	4 13 0
Wire rods	41.40	8 10 0	30.44	6 5 0	30.44	6 5 0	30.44	6 5 0
FINISHED STEEL								
Standard rails	$40.18	8 5 0	$31.66	6 10 0	$31.66	6 10 0	$31.66	6 10 0
Merchant bars	1.74c	8 0 0	1.06c	4 16 0	1.06c	4 16 0	1.18c	5 7 0
Structural shapes	1.68c	7 15 0	1.12c	5 1 6	1.12c	5 1 6	1.12c	5 1 6
Plates, ship, bridge and tank	1.79c	8 5 0	1.32c	6 0 0	1.32c	6 0 0	1.49c	6 15 0
Sheets, black, 24 gage	2.17c	10 0 0	2.12c	9 12 6	2.12c	9 12 6	2.20c	10 0 0
Sheets, galvanized, 24 gage, corrugated	2.47c	11 7 6	2.52c	11 8 9	2.52c	11 8 9	2.97c	13 10 0
Bands and strips	2.17c	10 0 0	1.21c	5 10 0	1.21c	5 10 0	1.29c	5 17 6
Plain wire, base	2.06c	9 10 0	1.46c	6 12 6	1.46c	6 12 6	1.43c	6 10 0
Galvanized wire, base	3.04c	14 0 0	1.76c	8 0 0	1.76c	8 0 0	1.73c	7 17 0
Wire nails, base	2.39c	11 0 0	1.46c	6 12 6	1.46c	6 12 6	1.49c	6 15 0
Tin plate, base box 108 pounds	$ 4.38	0 18 0	.....	.....	.....	.....	$ 9.01	1 17 0

*France

Domestic Prices at Works or Furnace—Last Reported			Francs		Francs		Marks	
Foundry No. 3 Pig Iron, Silicon 2.50—3.00	$16.44	3 7 6	$19.26	490(2)	$17.30	620	$19.81	83
Basic pig iron	15.95	3 5 6	20.63	525(1)	15.07	540	21.12	88.50
Furnace coke	3.17	0 13 0	6.60	168	6.00	215	5.13	21.50
Billets	29.83	6 2 6	24.36	620	22.60	810	28.05	117.50
Standard rails	1.79c	8 5 0	1.46c	810	1.62c	1,245	1.47c	136
Merchant bars	1.74c	8 0 0	1.22c	680	1.25c	965	1.48c	137
Shapes	1.84c	8 10 0	1.26c	700	1.22c	940	1.45c	134
Plates, ship, bridge and tank	1.95c	9 0 0†	1.46c	810	1.52c	1,170	1.65c	153
Sheets, black, 24-gage	2.28c	10 10 0	2.72c	1,510	2.60c	2,000	1.36c	126
Sheets, galvanized 24 gage, corrugated	2.58c	11 17 6	3.52c	1,955	2.99c	2,300	3.67c	340
Plain wire	2.06c	9 10 0	2.03c	1,125	2.15c	1,650	2.39c	221
Bands and Strips	2.17c	10 0 0	1.37c	760	1.50c	1,150	1.72c	159

*Middlesbrough; †Basic; ‡delivered; (1) Basic-bessemer; (2) Longwy. British export furnace coke £0 13s 0d ($3.17) f. o. b. Ferromanganese £19 6s 0d ($93.99) delivered Atlantic seaboard, duty-paid. German ferromanganese £15 0s 0d ($73.05) f. o. b.

The equivalent prices in American currency are in dollars per ton for pig iron, coke, semi-finished steel and rails; finished steel is quoted in cents per pound and tin plate in dollars per box. British quotations are for basic open-hearth steel; French, Belgian, Luxemburg, and German are for basic-bessemer steel.

Facilities

Six large plants and sixteen sales offices located at strategic centers and rendering a complete, nation-wide service on cold finished steels in all their varieties.

UNION DRAWN STEEL CO.

Machinery

Activity in Oil Industry and by Auto Parts Makers Results in Orders

New York—Machine tool buying and inquiry continue to drag. While several industries plan to increase production next month, notably radio builders, little in the way of new inquiry for equipment is expected. Several of the best consuming industries during the last two years are well equipped. While some increase is expected in the fall, many dealers and builders do not expect a pronounced spurt. Until the railroads and automotive interests enter the market for equipment no great improvement is expected. Several eastern railroads are in need of equipment and have considerable business out on which figures have long since been submitted. Actual business has been postponed from month to month.

Prices are unchanged and delivery on standard tools is normal. Grinding machinery is dragging slowly and export business has fallen off. A few machines are being placed, but orders are limited to one or two at a time and are not frequent. The navy department placed a turret lathe with a Cleveland builder. Four 16-inch engine lathes and one 18-inch went to Cincinnati and Cleveland builders. A milling machine has been placed with a Cleveland interest. Bids were rejected on two precision lathes for the Picatinny arsenal. Six automatic screw machines for the Frankford arsenal were awarded a New England builder. The navy department is inquiring for a plate bending roll machine for Brooklyn, N. Y. Shepard Niles Crane & Hoist Corp., Montour Falls, N. Y., has been awarded the contract for a 10-ton bridge crane by the bureau of yards and docks, navy department, for installation at Philadelphia.

Worcester, Mass.—Orders in single units, with inquiry light and scattered, continue to characterize the market. With the recent Chicago grinder awards practically shipped, manufacturers mostly have cleaned up their books with few prospects for the next several weeks. Replacement orders are few in all lines. Drills and lathes are very quiet and demand for small tools is light save for those sold at retail to the public.

Pittsburgh—Machine tool inquiry is slightly more active while awards remain only fair. New work consists mostly of individual tools with no large lists in prospect. Westinghouse Electric & Mfg. Co. is issuing occasional inquiries for several tools at a time, but has no large list before the trade. Railroads continue retrenched in their buying, some anticipated inquiries from roads in this district failing to materialize. Steel companies also are inactive in the market.

Cleveland — Encouraging reports are heard from several sources, indicating that machinery buying and inquiry are regaining some life. Manufacturers of oil well supplies, refinery equipment, pipe fittings and steel barrels are placing a few machines and inquiring for others. A situation has arisen in the automotive parts business which in some instances requires new and more efficient machinery. Prices on these parts have been reduced in some cases to the point where the manufacturer must either stand to lose on his product or install machinery which will cut his costs and permit a margin of profit. A dealer in this territory was awarded several machines by the federal government through Wright field, Dayton, O., for shipment to Panama. Buying continues slow in the Detroit district without much hope of picking up, due to the fact that automotive interests are already equipped for production far beyond present operations.

Chicago—While a fair volume of odds and ends inquiry for machine tools is pending, the sales volume is decidedly light. Several houses, however, are finding activity slightly better than in June. Dealers in this territory have bid on a list of about a half dozen items for Northern Pacific railroad, which probably will be closed in St. Paul within another week. A western railroad is in the market for a 4-foot radial drill. Majestic Household Utilities Corp. has completed the purchase of its production equipment for its plant in Chicago. A packing house closed on a planer and several other tools for its machine shop. Concerns working on motion picture equipment have been active in the market for a number of production tools. Machinery and equipment of the Master Sprayer Mfg. Co., 2524 West Congress street, Chicago, will be offered this week on order of the federal court. A number of the machine tool dealers of this district also are attending the sale of the Stearns Motor Mfg. Co. at Ludington, Mich.

Taylor Fichter Steel Mfg. Co., New York, has increased its capitalization from $50,000 to $150,000.

Industrial Machinery Exports Maintain Lead Over 1929

United States exports of industrial machinery for May showed an increase of 16 per cent in value over May, 1929, and brought the total for the five months to $110,181,000, compared with $104,041,000 for the corresponding period of last year, according to the commerce department's industrial machinery division. Metalworking, construction, and well and refinery machinery were mainly responsible for this gain.

Metal-working machinery exports as usual showed the greatest increase, a gain of 69 per cent for the month, while for the first five months this trade is 26 per cent above that of the corresponding period of last year. Engine lathes were one of the items which contributed to this growth, showing an increase of $500,000 for the month and a gain of 70 per cent for the longer period. Exports of milling machines moved from $1,107,000 to $1,565,000 based on the five months' comparison.

Steel Treaters Announce New Metal Publication

A new monthly publication dedicated to metal industries and designated *Metal Progress* will be published by the American Society for Steel Treating, Cleveland, the first issue to appear in September. Editorial contents will include descriptions of plants in the metal industry and other articles on the manufacture and fabrication of steel and nonferrous metals. Papers dealing with recent metallurgical investigations also will be presented in condensed and popular form.

As announced in the July 10 issue of STEEL, Ernest E. Thum, for the past three years associate editor of *The Iron Age*, has been appointed editorial director of the new magazine. Frank J. Enright, formerly Cleveland advertising manager for *Industrial Power* and for 20 years on the advertising staff of the McGraw-Hill Publishing Co., is western advertising counsellor and A. M. Morse Jr. is handling eastern advertising accounts.

Metal Progress will replace *Transactions* as the official monthly publication, the latter now becoming an annual bound record of papers presented before the society. Ray T. Bayless, for 8 years editor of *Transactions*, will continue in that position, although as announced in July 3 issue of STEEL, he has been promoted to assistant secretary of the society in charge of technical activities.

Construction and Enterprise

CONCISE, TIMELY BUSINESS BUILDING OPPORTUNITIES IN FIELD OF INDUSTRY

New England

BARRE, MASS.—Charles G. Allen Co., manufacturer of agricultural implements, is reported to be constructing a 2-story plant addition.

BOSTON—Woodcraft Supply Co., 187 Friend street, is reported to be in the market for woodworking machinery.

BOSTON—City, Joseph A. Conry, traffic commissioner, plans acquisition of Governors island for enlargement of its East Boston airport. Entire project may result in the expenditure of $1,000,000.

INDIAN ORCHARD, MASS.—Chapman Valve Mfg. Co., expansion plans for which were recently noted, will build a new steel foundry, estimated to cost $65,000, and a valve shop, estimated to cost $30,000. (Noted May 15.)

BRIDGEPORT, CONN.—United Illuminating Co., 128 Temple street, New Haven, Conn., has plans for construction of a power plant addition here. Cost is estimated at $300,000.

WINSTED, CONN.—Winsted Insulated Wire Co., recently noted as planning expansion of facilities, will acquire the plant of the former Empire Knife Co. (Noted June 19.)

PROVIDENCE, R. I.—Board of Contract and Supply will receive bids until July 21 for woodworking and metalworking machinery to be installed in junior high school at Chalkstone avenue.

Pennsylvania

ARDEN—County board of commissioners, Washington, Pa., plans alterations to boiler house at county home here. Bids will be taken soon. J. Merwin Beall & Son, Washington, Pa., are architects.

GREENVILLE—Chamber of commerce, care J. Dimmick, plans construcion of a 1-story, 60 x 150-foot plant to be leased to Adelet Mfg. Co., 4610 St. Clair avenue, Cleveland. Company manufactures electrical products. (Noted June 26.)

PHILADELPHIA — Eastern Metals Corp. will alter its warehouse at Frankford and Palmer street, as a cost of about $4200. H. W. Castor, Girard building, is architect.

PHILADELPHIA — Quaker City Iron Works, Tioga and Richmond streets, will erect a 1-story storage plant, 110 x 348 feet, at Aramingo avenue and Ontario street.

PHILADELPHIA—Aviation Corp. of America, 100 East Forty-second street, New York, has applied to mayor for a lease for 22 acres in the Air-Rail-Marine terminal at Hog island, near here. Company will manufacture seaplanes and will build a plant. First unit will contain about 50,000 square feet of floor space. Future expansions may increase plant to 600,000 square feet.

SHENANDOAH—Machine shop of No. 2 strip mine of Morea Colliery recently was virtually destroyed by fire. Loss is estimated at $10,000.

New York

ENDICOTT—International Business Machines Corp., 50 Broad street, New York, has begun work on a plant addition here, adding 60,000 square feet to its main plant. Extension will be completed in about three months.

LOCKPORT—Corson Mfg. Co., manufacturer of boxes, has awarded contract for a new plant here at a cost of $60,000, to William B. Eaton. James R. Tyler, National Bank of Rochester building, Rochester, N. Y., is architect.

SYRACUSE — Pierce, Butler & Pierce Mfg. Corp., 41 East Forty-second street, New York, whose plant here was recently noted as damaged by fire, will receive bids soon for reconstrucion of plant here. Plans are private. Cost is estimated at about $100,000. Company manufactures steam and water heated boilers. (Noted May 22.)

New Jersey

BOUND BROOK—Bakelite Corp., 247 Park avenue, New York, will build a plant of one, two and three stories, to include power house and machine shop, on Ruck road, near Reading railroad tracks. Cost is estimated at $150,000. Francisco & Jacobus, 511 Fifth avenue, New York, are architects. Company manufactures insulating materials.

HOBOKEN—Hoboken Iron Works, Third street, has purchased a 1-story plant building on a site 100 x 100 feet at 227 Jefferson street.

NEWARK—Riker Co., 480 Washington street, manufacturer of metal goods, suffered fire loss estimated at $4000.

Delaware

WILMINGTON—F. F. Slocomb & Co. Inc., Fourteenth and Poplar streets, manufacturer of leather machinery, will manufacture door operators under an arrangement with Cyco Automatic Electric Door Operator Co., 9 South Thirty-sixth street, Philadelphia. Cyco company plans establishing business here by incorporating as General Door Operator Corp. Charles F. Young will be president of the new company.

Ohio

MALTA—Brown Manly Plow Co. recently suspended operations and will install power equipment and build an addition to its plant. Operations will be resumed about Sept. 1.

SPRINGFIELD—Crowell Publishing Co. has awarded contract to Hillsmith & Co., Winters Bank building, Dayton, D., for the construction of a power plant addition. Generators, boilers, and other equipment will be installed.

Indiana

MUNCIE—Wildie L. Maitlen, 710 West Powers street, has been granted a permit for the construction of a 1-story 35 x 50-foot plant here for the manufacture of light ornamental and structural iron works and for repairing.

NEWCASTLE—Plant here of Chrysler Motor Corp., 341 Massachusetts avenue, Detroit, may become the principal unit of an accessories department recently formed within the organization.

RICHMOND—Plant of the McClelland Casket Hardware Co., South Fourth street, was recently damaged by fire. Loss is estimated at $75,000.

SEYMOUR—Seymour Mfg. Co., manufacturer of agricultural implements, plans addition and extensions for its plant here. Company has petitioned town for vacation of street and alley adjoining property now owned by the company.

Illinois

CHICAGO—U. S. Metal Products Co. has acquired the property it occupies at 2300 West Fifty-eighth street from William E. Thoresen, 1655 West Pershing road, its president. An addition to the plant will be constructed at a cost of about $16,000.

DECATUR—Biflex Products Co., R. F. Peterson manager, manufacturer of automobile bumpers, has closed its plant here and will transfer bumper production to its Detroit branch. Local plant will reopen in the fall for finishing of motor vehicle accessories, nature of products to be determined later.

PARIS—Stepp & Anderson Mfg. Co. is building a plant addition, two stories, 45 x 90 feet. Additional machinery will be installed for the manufacture of its own dies, at a cost of

about $4000. Company is a manufacturer of metal poultry equipment. Lawson Stepp is a member of the firm.

PEORIA—Keystone Steel & Wire Co., South Bartonville, plans to erect a 1-story plant addition for storage.

Michigan

DETROIT—Sattley Co., 3246 East Woodbridge street, manufacturer of coin handling machinery, has purchased a 4-story plant at East Fort and Mt. Elliott avenues.

DETROIT—Parke Davis & Co., McDougall avenue, plans an addition to its power plant. Smith, Hinchman & Grylls, architects, 800 Marquette building, have preliminary plans.

DETROIT—City department of recreation plans to erect a boiler plant at Kronk community center, McGraw evenue. Perry A. Fellows, city engineer, is preparing plans.

LANSING—Motor Wheel Corp., Saginaw street, is reported to be planning construction of a plant unit to cost $200,000.

Southern States

ATLANTA, GA.—Standard Oil Co., J. C. Pittman engineer, 764 Marietta street northwest, has closed bids for construction of units on Bankhead avenue northwest, to include 1-story garage, 60 x 134 feet, and 1-story blacksmith shop, 60 x 100 feet.

DAWSON, GA.—D. B. Brazeal machine shop was recently damaged by fire. Loss not reported.

TAMPA, FLA.—McMullen Aircraft Corp., Tampa boulevard, is considering erection of administration building and unit for repair shop and stock room if lease of Drew field is granted.

CORINTH, MISS.—Welding plant and garage of C. L. Bryan & Son was recently damaged by fire. Loss is estimated at $3000.

WEST POINT, MISS.—City, T. B. Miller clerk, will receive bids until July 22 for additions to power plant equipment, including diesel engine units, standard connected generator units and auxiliary equipment.

DERIDDER, LA.—Illinois Wire & Mfg. Co., Joliet, Ill., will erect a plant here for the assembly of fencing material.

MAYSVILLE, KY.—Kentucky Utilities Co. Inc., Starks building, Louisville, Ky., has approved plans for immediate improvements, to include enlargement of boiler room at its plant here, and replacement of boiler equipment with a water tube boiler and multiple retort stoker. Cost is estimated at $60,000.

Oklahoma

ASHER—Empire Gasoline Co., Bartlesville, Okla., has started construction of a large gasoline plant near here, to include a machine shop for repair work. Clay Briggs is chief engineer.

CHELSEA—City plans expansion of municipal power plant and will install additional equipment.

HARRAH—Oklahoma Gas & Electric Co., Oklahoma City, Okla., will construct an addition to the boiler house at its Horseshoe station near here.

OKLAHOMA CITY, OKLA.—Oklahoma Gas & Electric Co. has started construction of a 2-story addition, 139 x 186 feet, to its Belle Isle power plant. F. S. Partridge is company superintendent of construction in charge.

OKLAHOMA CITY—N. S. Sherman Machine & Iron Works, 18 East Main street, whose foundry recently was noted as having been damaged by fire, has acquired a 250-foot tract between Eight and Ninth streets. About 70,000 square feet are available for foundry purposes.

TULSA—Bartlett Electric Co. has leased a plant 50 x 150 feet, at 418 East Second street and will utilize part of space, 50 x 50 feet as a repair shop for armature work.

TULSA—Fremont Foundry Co., Trenton street, is erecting a foundry building, 50 x 60 feet, for first unit of grey iron foundry and shop plant. R. B. Fremont is president and general manager.

TULSA—Volcano Burner Co., L. H. Dodd general manager, 818 East First place, has leased part of building, 50 x 50 feet, for machine shop for machining oil field burners. Manufacture of oil field products is contemplated later and additional machinery will be installed.

Texas

BIG SPRING—Cosden & Co. plans enlargement of its machine shop and boiler house at its refinery here. J. E. Davis is chief engineer.

CORPUS CHRISTI—Central Power & Light Co., San Antonio, Tex., is considering construction of a power plant near here. Cost approximates $650,000.

HOUSTON—Davis Chemical Corp. plant now being built on Houston ship channel by Engineering Service Corp., Post Dispatch building, will include repair and service shop.

LUBBOCK—W. G. McMillan has contract for construction of a hangar unit, 50 x 100 feet, at municipal airport.

RAYMONDVILLE—P. J. Williams Industries, recently organized by P. J. Williams, plans operation of a machine shop in connection with its construction work on cotton gins, compresses and grain elevators.

Wisconsin

CEDAR GROVE—R. J. Schwab & Sons Co., 283 Calumet street, Milwaukee, will move its plant here about Sept. 1. About $50,000 will be spent for equipment and improvements and the number of employes will be increased from 60 to about 100. Portion of the Schwab company's plant in Milwaukee has been taken over by Wisconsin Gear & Engineering Co., 251 Reed street, Milwaukee. Schwab company has awarded contract for construction of a 1-story, 100 x 175-foot foundry addition here.

JANESVILLE—Schleuter Boiler Works, 320 North Main street, has postponed until fall erection of a proposed shop addition costing about $20,000. (Noted May 22.)

WATERTOWN—Mayor heads committee arranging for Rightway Corp. to locate here. Company proposes to occupy plant formerly used by Monarch Tractors Inc., and manufacture road maintenance equipment, cranes, rotary snow shovels and plows and a tractor-driving device.

WAUPUN—Metalworking building of the Althouse-Wheeler Co. was damaged by fire recently with loss of about $10,000. Structure 40 x 80 feet will be built to replace it. E. D. Doney is president of the company, which manufactures windmills and pumps.

WAUPUN—Industrial section, state prison, will have a new plant unit costing $80,000 for the manufacture of the state supply of automobile license tags. Arthur Peabody, state architect, Madison, Wis., has plans. A. W. Bayley, 509 Edgewood avenue, Madison, Wis., is secretary of the state board of control.

Minnesota

DULUTH—City council, recently noted as having plans for hangar units at Williams-Johnson airport, has asked for bids on the construction of a hangar and machine shop, 85 x 120 feet. Estimated cost $45,000. J. Wilson is city engineer. (Noted June 12.)

MINNEAPOLIS—General Electric Co., Schenectady, N. Y., is reported to be planning a plant and distribution building here at a cost of about $450,000.

Iowa

CEDAR FALLS—Clay Equipment Corp., Joseph B. Clay president, will install machinery immediately in an 80 x 100-foot plant addition now being completed to house its sheet metal department. Company makes gates and barn equipment.

COUNCIL BLUFFS—The Saul Aircraft Corp., W. I. Saul president, will soon place new type plane in production. Company plans expansion program, including erection of a permanent factory soon.

SIOUX CITY—Deere & Co., Moline, Ill., manufacturer of agricultural machinery and implements, is reported to have plans for a branch plant and distributing unit here, to be erected at a cost of about $150,000.

WATERLOO—Miller-Hillestad foundry and H. C. Matthias & Son cement block plant were recently damaged

by fire. Estimated loss at both plants $12,000.

WATERLOO — Highway commission, J. A. Paulsen district engineer, Marsh Place building, will let contract soon for construction of a maintenance garage, 34 x 110 feet.

WATERLOO—Moore Brothers Co. will soon begin production at 416 Seventh street west. Company was recently organized with L. H. Moore as president, to manufacture oat-hulling machinery.

Kansas

EL DORADO—Skelly Oil Co. plans enlargement of refinery here, including addition to boiler house and enlargement of machine shop. H. A. Miller is purchasing agent.

Nebraska

NEBRASKA CITY—Plant of R. A. Duff Engineering Co. was recently damaged by fire. Loss is estimated at $5000.

Colorado

PUEBLO—Highway shops of Pueblo county recently were damaged by fire to the extent of $50,000.

Pacific Coast

ONTARIO, CALIF.—Edison Electric Appliance Co., 5660 West Taylor street, Chicago, will spend approximately $1,000,000 on a plant addition here to be used for the manufacture of electric ranges. (Noted May 1.)

REDDING, CALIF.—Dallas Locomotive Co. is reported to have taken an option on the plant of Johnson Iron & Brass Works, recently damaged by fire. Dallas company plans to remodel the plant and add equipment and machinery. Foundry and machine shops for overhauling locomotives will be operated and lumber carriers, prune stoves and other metal products will be manufactured. Lew Carrigan, secretary of the chamber of commerce, is promoting the purchase.

MEDFORD, OREG.—D. Williams, engineer, has plans for construction of an electric smelter on the Rouge river, near here. Plant will employ 60 men.

Dominion of Canada

HAMILTON, ONT.—Norton Co. of Canada Ltd., Lottridge road, has let contract to W. H. Cooper, 6 Hughson street north, for the erection of a 2-story plant addition to cost $15,000. Building will be 40 x 50 feet. Company manufactures grinding wheels and polishing machinery.

ST. CATHERINES, ONT.—Canadian Warren Ring Co., manufacturer of axles and tools, has opened a branch at 215 West Fourth street, Vancouver, B. C., and plans plant additions for manufacture as well as assembly.

TORONTO, ONT.—University of Toronto, Queens park, plans construction of an addition to mining and metallurgical building. Unit is to be of four stories and will cost about $250,000.

TORONTO, ONT.—Hydro Electric Power Commission of Ontario, E. T. J. Brandon chief of electrical engineering department, University street, plans construction of a power plant here to cost $6,000,000.

WALKERVILLE, ONT. — Canadian Bridge Co., Walker road, has awarded contract to Ernest Clark Ltd., 200 Banwell avenue, for erection of a plant addition recently noted as planned. Estimated cost, $20,000. (Noted April 10.)

MONTREAL, QUE. — Robertson Lead Mfg. Co., 6744 Hutchison street, will build a plant 1-story, 80 x 270 feet, on a site recently acquired. Contract has been let to W. H. Madigan, 209 Clifton avenue. (Noted June 19.)

RADISSON, SASK.—City will rebuild municipal power plant, recently damaged by fire. New equipment will be added.

Recent Incorporations

LITTLE ROCK, ARK.—Bemberg & Sons Ironworks Inc. has been incorporated with $50,000 capital by Julius C. Bemberg, Little Rock, Ark., and Caroline Memberg, New Albin, Iowa, to operate an iron works.

CHICAGO—Blue Bird Air Service has been incorporated with $20,000 capital by Michael A. Caffarello, 5416 Byron street, to manufacture, sell and repair aircraft.

CHICAGO—R. Krasberg & Sons Mfg. Co., 829 Orleans street, has been incorporated with $25,000 capital by R. Krasberg, 6318 North Oakley avenue, to deal in metals.

CHICAGO—Lasker Boiler & Engineering Corp., 3201 South Lincoln street, has been incorporated with $500,000 preferred and 10,000 no par shares by Seymour E. Lasker, 701 North Central avenue, to deal in boilers and heating plants.

CHICAGO—Palmer Square Tool Works, 3326 Armitage avenue, has been incorporated with $20,000 capital by Nicholas M. Nelson and Oscar Hagen, to engage in jobbing and machine shop work.

LOUISVILLE, KY.—Springless Scale Co. has been incorporated with $30,000 capital by J. E. Bobb, 551 South Second street.

CHICAGO—Hokin Setel Co., 3700 West Thirty-eighth street, has been incorporated with $50,000 capital by Merrick, Nierman & Silbert, 111 West Washington street, to deal in goods, wares and merchandise.

LYNN, MASS.—Selectron Corp. has been incorporated with 1000 no par shares by Andrew L. Hansen, 19 Milford street, Boston, to manufacture and deal in radios and radio equipment.

WALPOLE, MASS.—L. S. Sayles Machine Co. has been incorporated by Walter A. Rockwood and Stephen P. Cushman to engage in general manufacturing and foundry business.

COLDWATER, MICH.—Titus Foundry Co. has been incorporated with 50,000 no par shares by L. C. and W. R. Titus to manufacture and deal in castings and parts.

DETROIT—Alfred A. Lee Inc., 2941 East Jefferson street, has been incorporated with 450,000 no par shares by Alfred A. Lee, 150 Dickerson street, to build and deal in motor boats.

DETROIT—Scheutz Safety Fender Corp., 1546 Jay street, has been incorporated with $50,000 and 3500 no par shares by Lee W. Fairchild, 14607 Turner street, to manufacture and deal in safety fenders and buffers.

ST. LOUIS — Sampson Industries Inc. has been incorporated by Charles L. Sampson, 6603 University drive, to manufacture radios.

ELIZABETH, N. J.—Elizabeth Iron Works Inc. has been incorporated with $125,000 capital by Stamler & Koestler, attorneys, 29 Broad street, to manufacture ornamental iron.

FAIR HAVEN, N. J.—Fair Haven Yacht Works Inc. has been incorporated with $125,000 capital by Lloyd J. Price, Toms River, N. J., to build boats.

HACKENSACK, N. J.—Richard J. Brust Inc. has been incorporated with $125,000 capital by Homer D. Smith, attorney, 810 Broad street, Newark, N. J., to manufacture generators.

NEWARK, N. J.—Auto Truck & Specialty Co. Inc. has been incorporated with $125,000 capital by David B. Silver, 24 Commerce street, to manufacture trucks.

BROOKLYN, N. Y.—Gates Mfg. Co. has been incorporated with $3000 capital by Giaccone & Richard, 117 Wilson avenue, to deal in machinery.

BROOKLYN, N. Y.—Modern Shoe Machine & Tool Mfg. Co. has been incorporated with $50,000 capital by E. Larkin, 381 Livonia avenue, to deal in shoe repairing machinery.

BUFFALO, N. Y.—Buffalo Pipe & Foundry Corp. has been incorporated with $100,000 preferred stock and 2000 common shares by Wilcox & Van Allen, Liberty Bank building, to operate a foundry.

MOUNT MORRIS, N. Y.—Mount Mor-

ris Iron & Metal Co. has been incorporated with 200 common shares by J. O. Moore, Liberty Bank building, Buffalo, to deal in metals.

NEW YORK—Upright Sheet Metal Works has been incorporated with $10,000 capital by Murray Felenstein, 220 Broadway.

NEW YORK—Three-In-One Unique Tool Co. has been incorporated with 200 common shares by O'Brien, Malevinsky & Driscoll, attorneys, 152 West Forty-second street, to deal in tools.

NEW YORK—Commercial Metal Equipment Co. of New York has been incorporated with $20,000 by Jacob Marx, 342 Madison avenue, to deal in furniture.

NEW YORK—J. H. Cottle Mfg. Co. has been incorporated with $25,000 capital by H. G. Bragg, 612 West 178th street, to deal in gas distributing machinery.

NEW YORK—Continental Slicing Machine Co. has been incorporated with $20,000 capital by R. L. Eckstein, 6 East Forty-fifth street, to deal in machinery.

NEW YORK—Reasonable Iron Works has been incorporated with $10,000 capital by A. L. Freeman, 233 Broadway, to deal in metal.

NEW YORK—Queensboro Scrap Metal Co. has been incorporated with $5000 capital by H. Maslow, 16 Court street, Brooklyn, to deal in metals.

UTICA, N. Y.—Valley Iron & Metal Corp. has been incorporated with $25,000 capital by Tumposky & Tumposky, attorneys, First National Bank building, to deal in metals.

UTICA, N. Y.—McCoy Iron Works has been incorporated with $60,000 capital by William E. Seavey, Mayro building, to operate an iron works.

PITTSBURGH — Superior Iron & Wire Works has been incorporated with 500 no par shares by Jacob Levinson, 6606 Dalzell street, to manufacture and deal in ornamental and structural iron, wire, and other metal products.

LUBBOCK, TEX.—Southern Plains Air Transport Inc. has been incorporated with $10,000 capital by C. R. Bacon and W. B. Price, to construct, operate and deal in airplantes.

RICHMOND, VA.—Manson-Smith Co. Inc. has been incorporated with $25,000 capital by S. L. Manson, 4200 Seminary avenue, to manufacture ornamental sheet metal.

LA CROSSE, WIS.—Bump Mfg. Co. has been incorporated with $200,000 by George P. Bump and Quincy H. Hale, 317 State Bank building, to manufacture air compressors.

NEENAH, WIS.—C. & M. Mfg. & Sales Corp. has been incorporated with 500 no par shares by Axel W. Meier and E. B. Bollins to manufacture and sell automobile parts.

MEDICINE HAT, ALTA.—Bechdolt Seeder Plow Co. Ltd. has been incorporated with $100,000 capital by Frederick Bechdolt and Edward Lust, to manufacture and deal in agricultural implements and to carry on the business of iron founder and metal worker.

KITCHENER, ONT.—Sutherland-Schultz Electric Co. Ltd. has been incorporated with $40,000 capital by Fred O. Schultz and Daniel M. Sutherland to deal in electrical equipment.

TORONTO, ONT.—Johnston Welding & Radiator Repair Co. Ltd. has been incorporated with $40,000 capital by Neil Edmondstone, 33 Hector street, to operate a welding and radiator repair shop.

WINDSOR, ONT.—Scott White Motors Ltd. has been incorporated with $80,000 capital by Thomas C. White, John Scott and John M. Duck, to manufacture and deal in automobiles, airplanes, motors, engines, etc.

MONTREAL, QUE.—R. C. A. Sound Equipments Ltd. has been incorporated with $50,000 capital by E. H. Cliff, 388 St. James west, to manufacture and deal in electrical apparatus and devices for transmitting sounds and pictures.

MONTREAL, QUE.—Thermocap Corp. Ltd. has been incorporated with 500,000 no par shares by H. N. Chauvin, 388 St. James west, to manufacture and deal in machinery, furnaces, boilers and heaters.

New Trade Publications

IMMERSION PYROMETER—Illinois Testing Laboratories Inc., 141 West Austin avenue, Chicago, describes in a current bulletin its pyrometer for accurate determination of the temperature of metals to be cast.

CENTRIFUGAL PUMPS—Pennsylvania Pump & Compressor Co., Easton, Pa., is distributing a bulletin on its double suction, single stage centrifugal pumps, with ample illustrations and full description of construction and operation.

MAGNETS—A bulletin by the Electric Controller & Mfg. Co., Cleveland, is devoted to use of its magnets for removing stray iron and steel from roadways. Surprising quantities are picked up and the roads thus made safer for motorists.

PICKLING EQUIPMENT—Weaver Bros. Co., Adrian, Mich., in a folder, presents the advantages of pickling equipment of monel metal for lasting qualities and resistance to corrosion. Illustrations show special equipment devised for various uses.

POWER TRANSMISSION—Worthington Pump & Machinery Corp., Harrison, N. J., has issued a bulletin describing its belts of multiple strands of V-shape and grooved pulleys to match the strands. Illustrations show their application.

SPECTRUM ANALYSIS — Adam Hilger Ltd., London, Eng., in a current bulletin covers the subject of spectrum analysis with references to recent papers on the subject and information as to its use in metallurgy and in medical applications.

HYDROGEN MEASUREMENTS—Leeds & Northrup Co., Philadelphia, has issued a notebook on the measurement of hydrogen ions. It is designed to be of use to those who seek to measure the acidity or alkalinity of water solutions by the electrical method.

INDUSTRIAL LOCOMOTIVES — Brookville Locomotive Co., Brookville, Pa., has issued a bulletin on its Ford-powered industrial locomotive, designed for economical production of tractive power. Illustrations show details of construction and the text describes advantages of operation.

INGOT MOLDS—Vulcan Mold & Iron Co., Latrobe, Pa., manufacturer of ingot molds of special iron, is distributing a map showing the location of its plant with relation to manufacturing centers to which its product is shipped. Facilities for direct shipment are indicated.

RAIL STEEL BARS—A bulletin by the Rail Steel Bar association, Chicago, explains the four grades of bars made for concrete reinforcement, shows the trade mark used by members of the association and gives the names of members of the association, who conform to the specifications.

ARC WELDING—Lincoln Electric Co., Cleveland, has issued a booklet on automatic welding with the carbon arc. It contains much information and describes in detail advantages of this process. Results of tests of strength and ductility are tabulated and described and tests by the laboratory of the Lincoln company are included.

MACHINE TOOLS—Bulletins suggesting methods of performing various machining operations on its machine tools have been issued by the Gisholt Machine Co., Madison, Wis. They cover a variety of operations, with illustrations showing how the machine is set up and operated. They are part of the service offered by this tool manufacturer.

HUMIDITY RECORDER—A direct-reading humidity recorder is described in a bulletin by the Leeds & Northrup Co., Philadelphia. In this device it is not necessary to consult a table to translate the relative temperature of wet and dry bulb thermometers, the relative humidity being recorded directly. A sample chart is included and illustrations show the construction and operation of the device.